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DETROIT

A National Newspaper for Every Branch of the Industry

Automotive Daily News

★CARS★ SHOP EQUIPMENT TRUCKS ★★AVIATION★★ PARTS ACCESSORIES ★TIRES★

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HUPP OFFERS NEW SIX AND NEW EIGHT

NEW ENGLAND AND EASTERN STATES MAINTAIN NEW CAR SALES AT HIGHEST LEVELS

Registrations in These Two Sections for Four Months Hold Closer to 1929 Totals; Pacific Coast Does Well

NEW YORK, June 12.—As indicated by new passenger car sales, business in the New Enland and Eastern states was at a higher level in the first four months of the current year than in the other sections of the country. New car sales, as shown by the actual registration figures, were off in each of the geographical divisions, but the declines in those two groups of states were smaller than the falling off in the other sections.

In the six New England states sales of new cars amounted to 71,410, as compared with 84,171 in the corresponding period of last year, a decline of only 15.1 per cent. This was in contrast to a decline for the country, as a whole, of 20.3 per cent. in the four months. The April loss was greater than that of the preceding months, however, with the result that the four months' decline of 15.1 per cent. compares with a drop of 11 per cent. for the first quarter of the year.

Here are the registrations by seven geographical divisions for the four months, as compared with 1929, with the percentage of decline shown:—

	1930	1929	% Loss
New England.	71,140	84,171	15.1
East	231,367	275,227	15.9
South	215,123	273,941	21.5
Great Lakes	282,634	371,220	23.8
Middle West	99,359	127,530	22.1
Rocky Mountain	34,041	46,922	27.3
Pacific Coast.	95,885	119,049	19.4

Among the New England states, New Hampshire made the best record, with a decline of only 4.2 per cent. in sales from the first four months of last year. Massachusetts and Connecticut, the two heaviest

(Continued on Page 2)

FAKE FOREIGN FORD STOCK WARNING IS ISSUED BY BUREAU

Detroit, June 12.—A warning against fraudulent brokers and promoters who are offering stock in foreign Ford motor companies was issued today by the Better Business Bureau of Detroit, in conjunction with the National Better Business Bureau and affiliated offices throughout the United States and Canada.

Relying on the good will and integrity of the Ford name, thousands of persons throughout the country have purchased stocks which either turned out to be spurious or were not delivered at all, the warning said. There is no way of estimating the financial loss involved.

"There are a number of fraudulent concerns in various parts of the country that represent themselves as brokerage houses and that offer stocks in various foreign Ford companies," the statement from the Better Business Bureau said.

"Several of these companies sell

(Continued on page 12)

HIGH-PRICED CAR SALES HOLD STRONG

NEW YORK, June 12.—Despite predictions at the start of the year that the sales of the higher-priced passenger cars in 1930 would be cut in half, as compared with 1929, the registration figures for the first four months show that sales of this class of vehicle have held up well, falling off only 26 per cent. from the corresponding period of last year.

Registrations of the nine leading sellers among the high-priced cars in the four-month period totaled 25,162, as compared with 34,410 in the corresponding period of last year, a decline of 9,248 units.

The nine cars used in this compilation are the Packard, La Salle, Franklin, Cadillac, Pierce-Arrow, Lincoln, Cord, Stutz and Black Hawk.

Among these cars, the only one to show a gain over a year ago was Pierce-Arrow, with registrations in the four months of 2,611, as compared with 2,095 in the corresponding period of 1929, an increase of 24 per cent. Sales of the Pierce-Arrow car have shown consistent gains since the company was taken over by the Studebaker Corporation in the fall of 1928.

Sales of the Franklin car made

(Continued on page 12)

PIERCE-ARROW JUNE SALES SET NEW LEVEL FOR YEAR

Buffalo, N. Y., June 12.—The Pierce-Arrow Motor Car Company today reported that retail deliveries for the last ten days of May were the largest of any ten-day period since January 1.

Sales for June indicate a definite upturn, which partially is accounted for by the introduction of improved models in the lowest-priced of the three groups of straight-eights offered by the company.

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NEW "8" IS LOWEST PRICED IN COMPANY'S HISTORY; SIX BODY STYLES IN EACH LINE

Wide Range of Mechanical Improvements Feature Increased Power, Speed and Greater Flexibility

DETROIT, Mich., June 12.—The lowest priced eight cylinder car in company history and a new six cylinder series are announced today by the Hupp Motor Car Corporation of this city. The addition of these two series brings the total of Hupmobile products to five separate lines of cars—one in the six and four in the eight cylinder groups.

The two new cars, like their predecessors of 1929, are known as the Century Eight and Century Six. The new eight develops ninety horse power and a speed of seventy-five miles an hour, while the six develops seventy horse power and a speed of like figure. The new Century Eight follows out Hupmobile's straight eight construction with high compression cylinder head. It is claimed to have an acceleration of from five to fifty miles an hour in twenty seconds. Mechanically, the new six generally follows out the design lines of the former Century Six, but develops more speed and considerably greater horse power, as well as a much faster getaway.

SIX BODY STYLES IN EACH LINE

In both the new eight and six series there are six body styles. These include the five-passenger, four-door sedan; convertible cabriolet, five-passenger phaeton, commercial coupe, coupe with rumble seat and roadster with rumble seat.

Price ranges of the new Century Eight, in addition to being the lowest ever made by the company on this type of product, again bring to purchasers a Hupmobile car definitely within the $1,300 price field.

The factory prices for this series are: commercial coupe, $1,345; coupe with rumble seat, $1,395; sedan,

(Continued on Page 3)

CREDITORS' COMMITTEE SUGGESTS SETTLEMENT OF STUTZ INDEBTEDNESS

Indianapolis, Ind., June 12.—The chairman of the creditors' committee of the Stutz Motor Car Company has just made public a plan, which is being presented to all creditors of the company, for paying off the present indebtedness of the organization at 35 cents on the dollar and keeping the company in operation as a going concern. The essentials of the plan, quoting the chairman, are as follows:—

"The committee feels gratified that it is able to submit for your acceptance an agreement of composition which is fair, being several times as much as would have been paid in bankruptcy, and at the same time the Stutz company continues as a going concern, in better shape by reason of the assistance given by the creditors, and will continue as a customer.

"The proposal is to pay you on or before June 24, 35 cents (thirty-five cents) on the dollar, on your past due open book account and on past due notes against the Stutz company. The Stutz Motor Car Company agrees that all commitments for materials undelivered remain unchanged and that they will take it as needed in their production at regular prices."

A. S. M. E. Hears Discussion On Small Plant Operation

Special from A. D. N. Detroit Bureau

DETROIT, June 12.—Following discussion on two papers, read at the session of the American Society of Mechancial Engineers, Fairfield E. Raymond, assistant professor of industrial research, Massachusetts Institute of Technology, said: "It is now evident that the success of a small manufacturing plant and the earnings of its capital can be as large as that of the large mass-production industry if the small plant does not try to manufacture an article at the minimum cost."

This statement followed the articles by Crosby Field, vice-president of the Brillo Manufacturing Company of Buffalo, N. Y., and A. B. Reynders, works manager of the Westinghouse Electric and Manufacturing Company, Springfield, Mass.

Reynders maintained that for production in an industry where output was intermittent, it is not

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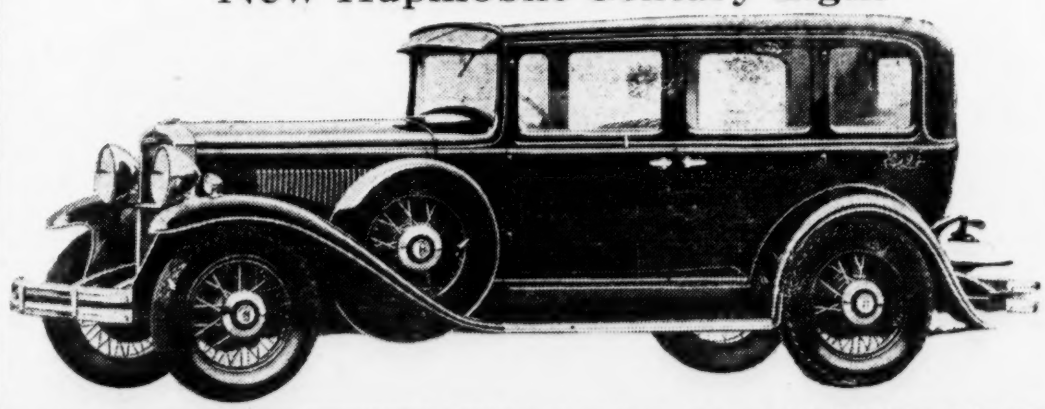
New Hupmobile Century Eight



A NEW CENTURY EIGHT HUPMOBILE SEDAN is shown above. It is one of six body types of the new straight eight series in the $1,300 price field announced today by the Hupp Motor Car Corporation. It is the lowest priced eight ever built by Hupp. It boasts 90 horse power, 75 miles an hour and unusual acceleration

Baldwin Named Ass't Sales Manager of Pierce-Arrow

BUFFALO, N. Y., June 12.—William Baldwin has been appointed assistant general sales manager of Pierce-Arrow, and Waldo Fellows, formerly of Oakland, becomes advertising manager, the position formerly held by Mr. Baldwin.

Baldwin has been asociated with Pierce-Arrow for thirteen years, during the last six of which he has been advertising manager. In his new capacity he will have charge of retail sales development, while A. M. Russell, also an assistant general sales manager, will be in charge of distribution.

Waldo Fellows comes to Pierce-Arrow from the Oakland Motor Car Company at Pontiac, with which he has been connected for seven years, formerly as advertising manager and lately as assistant general sales manager.

New England and Eastern States Set New Car Pace

(Continued from Page 1)

states in sales, showed declines of 14 and 18.9 per cent., respectively.

As the above table shows, the six Eastern states of New York, New Jersey, Pennsylvania, Maryland, West Virginia and Delaware were not far behind New England for the sales honors for the first four months. The decline for this block of states was only 15.9 per cent., with 1930 registrations of 231,367 comparing with 275,227 in the corresponding period of last year.

As in the case of New England, the less populous states made the better records in sales. Maryland, with a loss of only 4.5 per cent., led, with Delaware second, with 9 per cent.

In the thirteen Southern states, the four months sales totaled 215,123, as compared with 273,941 a year ago, a falling off of 21.5 per cent. This was close to the average drop for the entire country. Despite the better records made by New England and the East as the whole, those groups were unable to produce a state with more registrations in the first four months of this year than last. The South turned in two such states, Florida, with a gain of 2.6 per cent. and Alabama, with an increase of 7.4 per cent, the best record made by any state in the country. The biggest decline for any state in the Union also was made in the South, North Carolina's sales dropping 51.6 per cent. from a year ago.

The Great Lakes tier of states reported 282,634 new car sales for the four months, as compared with 371,220 in the corresponding period of last year, a decline of 23.8 per cent. Outstanding among these states are Minnesota and Wisconsin, again the least populous, with declines of only three-tenths and nine-tenths of 1 per cent., respectively.

The Middle Western agricultural section was also able to contribute a state that made a gain over last year. Iowa, where registrations of 29,533 compared with 29,024, a gain of 1.7 per cent. The next best record was in South Dakota, where the decline was 18.8 per cent.

The aggregate decline in the eight Rocky Mountain states was the largest of any group of states in the country, amounting to 27.3 per cent. Registrations totaled 34,041, as against 46,922 a year ago. One state in the group, however, was able to hold its own, the sales in Idaho amounting to 4,163, as against 4,161 a year ago. The next best record was made by Nevada, with a falling off of 9.5 per cent.

The three states of the Pacific Coast, as a group, held pretty close to their record for the first quarter, the decline for the four months amounting to 19.4 per cent., as against a drop of 19 per cent. in the first three months. Sales totaled 95,885, as against 119,049 in 1929. Washington reported the best record, with a decline of only 3.2 per cent.

The Pacific Coast tier was the only group to do better than the average, excepting New England and the East.

Following are the new car registrations for the first four months of this year by individual states, arranged geographically, as compared with the corresponding period of last year, with the percentage of gain or loss indicated:

NEW ENGLAND

	1930	1929	% Chg.
Massachusetts	40,092	46,660	—14.0
Connecticut	14,657	18,084	—18.9
Rhode Island	5,684	6,783	—16.2
Maine	4,797	5,913	—18.8
New Hampshire	3,435	3,586	— 4.2
Vermont	2,745	3,165	—13.3
Totals	71,410	84,171	—15.1

EAST

	1930	1929	% Chg.
New York	94,969	116,710	—18.0
Pennsylvania	70,562	86,516	—18.4
New Jersey	38,405	41,747	— 8.0
Maryland	14,643	15,347	— 4.5
West Virginia	9,958	11,910	—16.3
Delaware	2,830	2,997	— 9.0
Totals	231,367	275,227	—15.9

SOUTH

	1930	1929	% Chg.
Texas	49,911	70,417	—28.2
Missouri	45,139	50,009	— 9.7
Virginia	16,909	18,333	— 7.7
Tennessee	15,746	19,610	—19.7
Florida	14,001	13,614	+ 2.6
Kentucky	13,575	19,006	—28.6
North Carolina	11,783	24,379	—51.6
Georgia	11,107	13,695	—18.1
Louisiana	10,571	12,955	—18.4
Alabama	10,437	9,716	+ 7.4
Arkansas	8,497	11,672	—27.2
South Carolina	7,447	10,535	—29.3
Totals	215,123	273,941	—21.5

GREAT LAKES

	1930	1929	% Chg.
Illinois	69,507	83,537	—16.7
Ohio	64,581	94,693	—31.8
Michigan	60,328	92,688	—34.9
Indiana	33,234	44,973	—26.1
Minnesota	27,680	27,930	— 0.3
Wisconsin	27,304	27,399	— 0.9
Totals	282,634	371,220	—23,8

MIDDLE WEST

	1930	1929	% Chg.
Iowa	29,533	29,024	+ 1.7
Oklahoma	22,651	32,591	—30.0
Nebraska	17,470	23,939	—27.0
Kansas	16,865	24,053	—29.9
South Dakota	7,787	9,587	—18.8
North Dakota	5,053	8,336	—39.4
Totals	99,359	127,530	—22.1

ROCKY MOUNTAIN

	1930	1929	% Chg.
Colorado	11,724	15,547	—24.5
Montana	4,768	8,553	—44.2
Utah	4,173	5,286	—38.1
Idaho	4,163	4,161	+ 0.004
Arizona	3,582	5,785	—21.1
New Mexico	2,322	3,212	—27.7
Wyoming	1,941	2,867	—32.4
Nevada	1,368	1,511	— 9.5
Totals	34,041	46,922	—27.3

PACIFIC COAST

	1930	1929	% Chg.
California	70,450	90,581	—22.2
Washington	16,203	16,828	— 3.2
Oregon	9,232	11,640	—20.7
Totals	95,885	119,049	—19.4

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3rd 2.87 2.04
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C. J. BARTLETT OF G. M. EXPORT SAILS ABROAD

New York, June 12.—C. J. Bartlett, managing director of General Motors, Ltd., London, who arrived on the Bremen June 6 for a short visit to the home office, sailed for England June 10, making the return trip on the Bremen.

R. K. Evans, managing director of Vauxhall Motors, Ltd., Luton, England, arrived in New York June 6 on the Bremen for a short visit to the home office of General Motors Export Company.

M. F. Lawrence of the president's staff of General Motors Export Company returned to New York June 6 on the Bremen, after a short visit to General Motors plants in England.

T. W. Henderson, manager of the Cadillac-La Salle division of General Motors Export Company, sailed for Copenhagen, Denmark, today on the Deutschland for a visit to all the European plants of General Motors Export Company. He was accompanied by Mrs. Henderson.

A. Lincoln Cooper, color adviser of General Motors Export Company, who has been on a short trip to General Motors plants in Argentina, Brazil and Uruguay, returned to New York June 10 on the Western Prince. He was accompanied by Mrs. Cooper.

A. Pithkethley, works manager of General Motors Argentina, Brazil, who has been working on a special assignment at the three South American plants of General Motors Export Company for the past year, returned to the home office June 10 on the Western Prince. He was accompanied by Mrs. Pitkethley.

S. E. Ditmer, assistant production manager of General Motors Japan, Osaka, who has been on a visit to the home office of General Motors Export Company, sailed for Japan today from Seattle, on the Empress of Canada. He was accompanied by Mrs. Dithmer.

A. A. Maynard, transportation engineer of Adam Opel, A. G., who has been on a short visit to the home office of General Motors Export Company, sailed for Germany today on the Deuschland. He was accompanied by his family.

LISTS OF FLEET OWNERS

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SPARKS from DETROIT

Vacations Are Here Again

* * *

Hudson's Big Week

* * *

Rumors From Rouge River

* * *

Fred Kingsbury—Detroit Editor

VACATION periods are arriving at several of the automobile manufacturing plants in Detroit, and, following a precedent set last summer, a number of the factories are planning to close for two weeks, in order that all employees may have the advantage of a short summer vacation period.

Continental Motors has just announced that it will follow this plan and Hudson also has adopted it. Several others will do likewise, although they have not yet made announcements to that effect.

* * *

TALKING with Hudson officials the other day, we discovered that the last week in May was the greatest sales week the company has enjoyed so far this year.

* * *

STORIES to the effect that the Rouge plant of the Ford Motor Company would close for ten days or two weeks some time this summer have been going around, although they have not been verified. This close-down will be to enable the company to complete its new aqueduct to the Rouge River, in order to augment the water supply of the plant. A huge volume of water is required every day at these large factories, and improvements in plant equipment are being made constantly.

* * *

WE noticed a story recently to the effect that Auburn had recently added 142 dealers, which shows that N. E. McDarby, Auburn sales director, must have been even busier than usual. Mac is always on the job, and is among the sales executives in the motor car industry who are never too busy to see visitors.

* * *

THE Duco Color Advisory Service, in a copyrighted article, reports there has been a sharp increase in the use of blue in automobile finishes. It also is interesting to note that this service states that the length of time which a hue can maintain a high index position as an automobile finish seems to depend to some extent upon the number of distinctive variations available. Gray, yellow and black, Duco says, are finishes that offer a restricted range of usable variations. These finishes become monotonous and commonplace with volume production sooner than blues, browns and greens, because of the infinite range of practical variations available in the latter three colors.

Which causes us to wonder what has become of the flashy color combinations so popular a year ago. We noticed automobiles along the production lines at several of the plants we visited in the past week and were impressed with the subdued color combinations in effect at the present time. Inquiry brought out that people are requesting subdued colors and that there is little demand for flashy combinations, with the exception of a few roadsters, made especially for use by the younger set.

* * *

EDWARD N. HINES, Wayne county road commissioner, is pleased these days because the State Highway Department is going to spend some more money in this section.

In addition to the large mileage of concrete roads, grade separations and bridges planned by the Wayne County Road Commission, the State Highway Department has appropriated approximately $1,600,000 for similar activities in this county.

* * *

Although Don Alexander, who looks after the Budd interests, is one of the busiest men in Detroit, he is never too busy to talk to visitors who have business at the plants. He is a man who insists on the greatest courtesy from all his employees in greeting the public.

If you call the plant on the phone in the morning you are always greeted with "Good Morning. This is the Budd Wheel Company." This courtesy is greatly appreciated, and has been called to our attention any number of times by visitors in Detroit who have had occasion to call that factory.

New Hupp Lines Offer Increased Power, Speed

MANY REFINEMENTS INCLUDED IN BOTH BODIES AND CHASSIS

(Continued from Page 1)

$1,395; convertible cabriolet, $1,450; phaeton, $1,450, and roadster, $1,475.

In the new six-cylinder series prices range from $1,145 for the commercial coupe to $1,275 for the roadster. Other model prices are $1,195 for the four-door sedan, $1,195 for the coupe with rumble seat, $1,250 for the five-passenger phaeton and $1,250 for the cabriolet.

One of the outstanding features of the new Century Six and Century Eight models is the wide variety of color combinations offered. Through a special manufacturing arrangement, any color combination that is standard on the Century Six is optional to the buyer of the Century eight, and vice versa.

In outward appearance both the new eight and six have unbroken lines from radiator to tail lamp. Accentuating the car's length are the bead moldings, which are compressed into the side panels, instead of applied, and which carry contrasting color lines. Radiators are high and narrow, being suggestive of speed through less frontal wind resistance. A large and embossed radiator cap is used. The Century Eight has radiator shutters, thermostatically controlled.

Fenders on both the eight and six cylinder Centuries are long and sweeping, emphasizing Hupp's traditionally short running board. A new type of covering, similar to fabric-backed stairway treads, and exceptionally durable, is included on the running boards of both new models. Interior upholstery is of high quality mohair, with a cap designed for long wear. Special machine buffed, Bedouin grained leather in harmonizing tone is used in the roadster and phaeton of each series. In both sedans decorative dome lights with pillar switches and three rear curtains are used.

The indirectly lighted instrument panels of both new cars are attractively finished in walnut, as are the garnish moldings in all body types of the two models. Instrument groupings, nicely laid out, are similar on the two cars. The instruments are grouped in three separate panels. On the left is the speedometer, in the center the gasoline gauge and heat indicator and on the right the ammeter and oil gauges. On both models the starter control is placed at the lower edge of the left side of the dash within convenient reach. A manifold heat-control lever is also part of the dash equipment on the Century Eight.

Contrary to conventional practice in cars of this price class, the new cars both have adjustable seats (except roadster and phaeton) and adjustable steering. A full three-inch variation in front seat adjustment provides accommodations for practically all drivers.

Coupled with this feature the adjustable steering column makes it a simple matter to fit any driver for ease. Both cars are equipped with complete comfort and handling large cowl ventilators.

Several mechanical features on the new cars are of importance. Chief among these is a revolutionary rubber mounting and insulating device used in the new Century Eight. Instead of the conventional rubber insert mounting between the rear engine supports and the frame, the rear engine to frame contact is a solid, metal-to-metal contact, providing greater rigidity where needed—at the rear of the engine.

A solidly mounted pressed steel cross member, which carries the rear end of the power plant, surrounds the clutch housing. At four points it is attached to flanges on the flywheel housing, which is solidly bolted to the clutch housing. Bonded rubber brackets are used circumferentially in this heavy rear cross member—acting as rubber inserts about its diameter to damp out engine noise and vibration and prevent them from reaching the interior of the car body. The front of the engine utilizes the compressed type of rubber mountings—so that the front end of the engine is really cradled in live rubber.

Another mechanical innovation is found in the water pump of the new Eight. The pump is mounted above the block to permit installation of a large fan for cooling.

A unique double seal packing is used on the pump. A plastic packing, supplied in sticks, is inserted in a drilled hole in the top of the pump housing. A threaded tension bolt screws into the hole, tightening the packing. The remainder of the double seal is formed by a tapered lead bushing, so constructed that any additional force applied to the packing forces this lead bushing into a closer fit on the pump shaft.

The crank shaft of the New Century Eight is of the five bearing type and weighs 90½ pounds. It is fully counterweighted, with the counterweights mounted opposite each throw, and it is also statically and dynamically balanced. A vibration damper further assures quiet and vibrationless performance.

There are forty-six points on the eight-cylinder engine under pressure lubrication. These are five main bearings, eight connecting rod bearings, six cam shaft bearings, sixteen valve lifter arms, eight piston pins, one distributor shaft bearing and two oil pump gear bearings. In the new Century Six all main connecting rod and piston pin bearings, as well as to the complete valve lifter assemly are pressure lubricated. This is rarely found in a car in this price class. Much of the credit for long life and economical upkeep of Hupmobile cars is due to the care taken in providing pressure lubrication to those vital points in engine performance. The connecting rod bearings of both cars are diamond bored and the connecting rods are rifle drilled to provide this positive type of lubrication. Both are typically Hupmobile practices. As in all its other cars, Hupmobile hones the inside of the cylinder walls on both models and weighs, balances and selects the springs in sets of four for each car type. Both pistons and connecting rods are weighed and balanced in sets for each engine.

The bore and stroke of the new eight-cylinder engine are $2^{7}/_{8}$ and $4^{5}/_{8}$ inches respectively. The piston displacement is 240.2 cubic inches, while the standard compression ratio is 5.2 to 1. The cylinders are cast en bloc with the upper half of the crankcase of a special analysis of Mayari iron. Pistons in this engine are of a special new type in which the head is definitely and completely insulated from the skirt to prevent piston distortion.

They are of aluminum alloy and have an air gap between the head and the skirt, while two integrally cast ribs on the inner side of the skirt assist in holding this part of piston to a minimum of distortion. These pistons, one of the newest proved developments in automotive engineering, are as hard as cast iron, have similar wearing qualities, yet lare much lighter than cast iron.

The intake valves of the new eight are of nickel-chromium steel, and the exhaust valves are silchrome, heat-resisting steel, both of one-piece construction. The valves are actuated by airplane type "rocker arm" lifters—an exclusive Hupmobile eight feature since 1925. The chief advantage of this type of lifter is the reduction of the total reciprocating weight of the valve mechanism — this lighter reciprocating weight bringing increased motor quiet because of the lighter valve springs needed with this type of lifter. Two telescoping valve springs are used. The entire valve mechanism is inclosed for protection against grit and dirt, and is lubricated both by spray from the crank case and by pressure.

The cam shaft of the new car is driven by a silent steel chain, while a corrugated V-belt drives the generator.

The Hupmobile Century Six crank shaft is of the four-bearing type. It is a steel forging double heat-treated and counterbalanced. It weighs 76½ pounds. The shaft is drilled for pressure lubrication to all bearings, and is tested for static and dynamic balance. Bearing diameters are approximately 2⅞ inches. All main bearings are bronze, lined with high-speed babbitt.

The counterweights of the Century Six shaft are designed and located so as to provide the maximum balancing effect with a minimum of added rotating weight. This marks the Hupmobile crank shaft as being the most scientifically designed of any now used in engines anywhere near its size and price.

This type of crank shaft in an engine the size of the Hupmobile Century Six eliminates the necessity of a vibration damper. Tests have proved there is no noticeable difference throughout the entire speed range of this engine with or without a vibration damper, thus showing that the natural torsional period of perceptible amplitude is above the maximum speed of the engine.

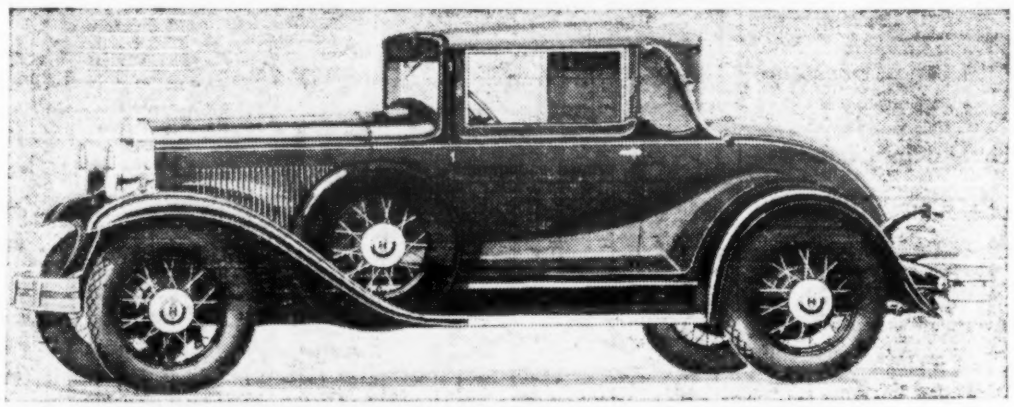
The connecting rods are "I" beam section, special steel forgings, double heat-treated. The rod is drilled the entire length for pressure lubrication to piston pin.

The rod bearings at both ends are diamond-bored simultaneously, insuring accuracy and perfect parallelism.

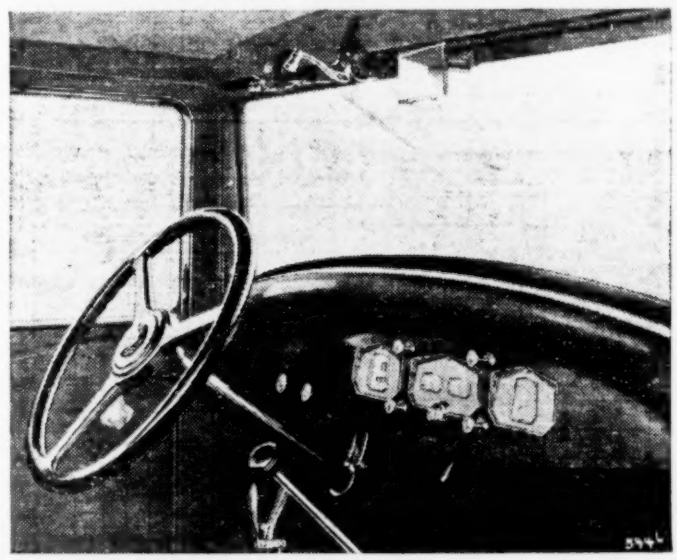
The pistons are of heat-resisting alloy. The rate of expansion of this type of piston approximates that of cast iron. Conforming to Hupmobile's practice, both compression and oil control rings are fitted above the piston pin. There are two compression rings, each ⅛ inch in width, and two oil control rings of the same width.

The Hupmobile Century Six valves have a clear opening of 1⅜ inch, with 5-16 inch lift, and seat on a 45

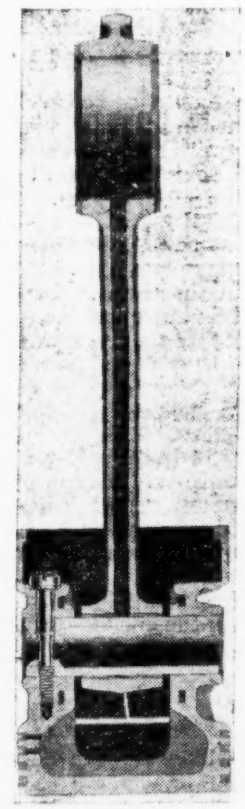
(Continued on page 12)



OPEN AIRED FREEDOM, with closer car comforts, characterizes the new Century Six Coupe Cabriolet. Two additional passengers may be carried in the commodious rumble seat



ALL INSTRUMENTS are neatly grouped in three sections on the instrument panel of the new Century Eight Hupmobile shown above



THE CONNECTING RODS of both the new Century Six and Century Eight Hupmobile are rifle-drilled their full length for pressure lubrication to the piston pins

WISCONSIN AXLES

Sudden starts, quick stops—loads, speed and jolts. All the abuse a truck can get. Call it a test—but it's all in the day's work for Wisconsin Axles.

WISCONSIN AXLE CO.
Oshkosh Wisconsin

CLARK

CLARK AXLES and METAL WHEELS

fulfill the rigid requirements of the larger truck and passenger car manufacturers. Built in a plant with large production capacity.

CLARK EQUIPMENT COMPANY
Buchanan Michigan

AXLES Front & Rear
WHEELS Single or Dual Tire
CAST STEEL HOUSINGS
TRANSMISSIONS

Cumulative New Commercial Car Registration Statistics, May, 1930

States	Autocar	Brockway-Indiana	Chevrolet	Diamond-T	Dodge	Dover	Fargo	Federal	Ford	G. M. C.	International	Mack	Paige	Relay	Reo	Republic	Rugby	Sterling	Stewart	Studebaker	Whippet	White	Willys	Willys-Knight	Miscellaneous	Totals	States
s	4	11	661	71	51		12	4	911	36	135	18	3	2	19		1	2	5		13	12	15		78	2074	Illinois

Automotive Daily News

"Of, By and For the Entire Automotive Industry"

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Machine Age Transition

IN an address before the meeting of the American Society of Mechanical Engineers in Detroit, Ralph Flanders, vice-president of that body, brought up an interesting phase of the change from hand to machine work or from slower machines to faster ones. He remarked that for 140 years inventors of machines have been in some measure responsible for throwing men out of work.

In the beginning of the machine age, men used to earning a living by their hands were panic stricken at the arrival of the new methods of performing their familiar tasks faster and cheaper. The hand workers thought that they were to be driven into starvation. The strike of the hand weavers in England assumed almost the aspect of a civil war.

The passing years have proved that machine labor does not permanently throw any one out of employment. Machine made products are so much cheaper than those created by hand labor that they find greater markets. More and more people buy them, so that it actually takes more men working at the machines to meet this new demand than once labored by hand to produce the former product. With our experience of almost a century and a half in the use of machines, we now accept this as an elementary fact in economics.

However, there is a transition period in the use of machinery or better machinery, when the improved method of production actually does cause unemployment. This is the period that lies between the beginning of increased speed in manufacture and the creation of the larger market for the product.

However, the mechanical engineers and the inventors need not feel conscience-stricken, because in the end they create new industries, greater markets and a more insistent demand for labor.

Do the Bankers Like the Tariff?

JUST exactly what class of Americans likes the Hawley-Smoot tariff bill now pending in Washington is not very clear. So far we have not been able to find any one to whom it is anything but anathema. Even the farmers who were supposed to be the principal beneficiaries are almost a unit against it, barring the few who are growing sugar beets.

The latest important personage to take a shot at this Orphan Annie among legislative measures is John G. Lonsdale, president of the American Bankers Association.

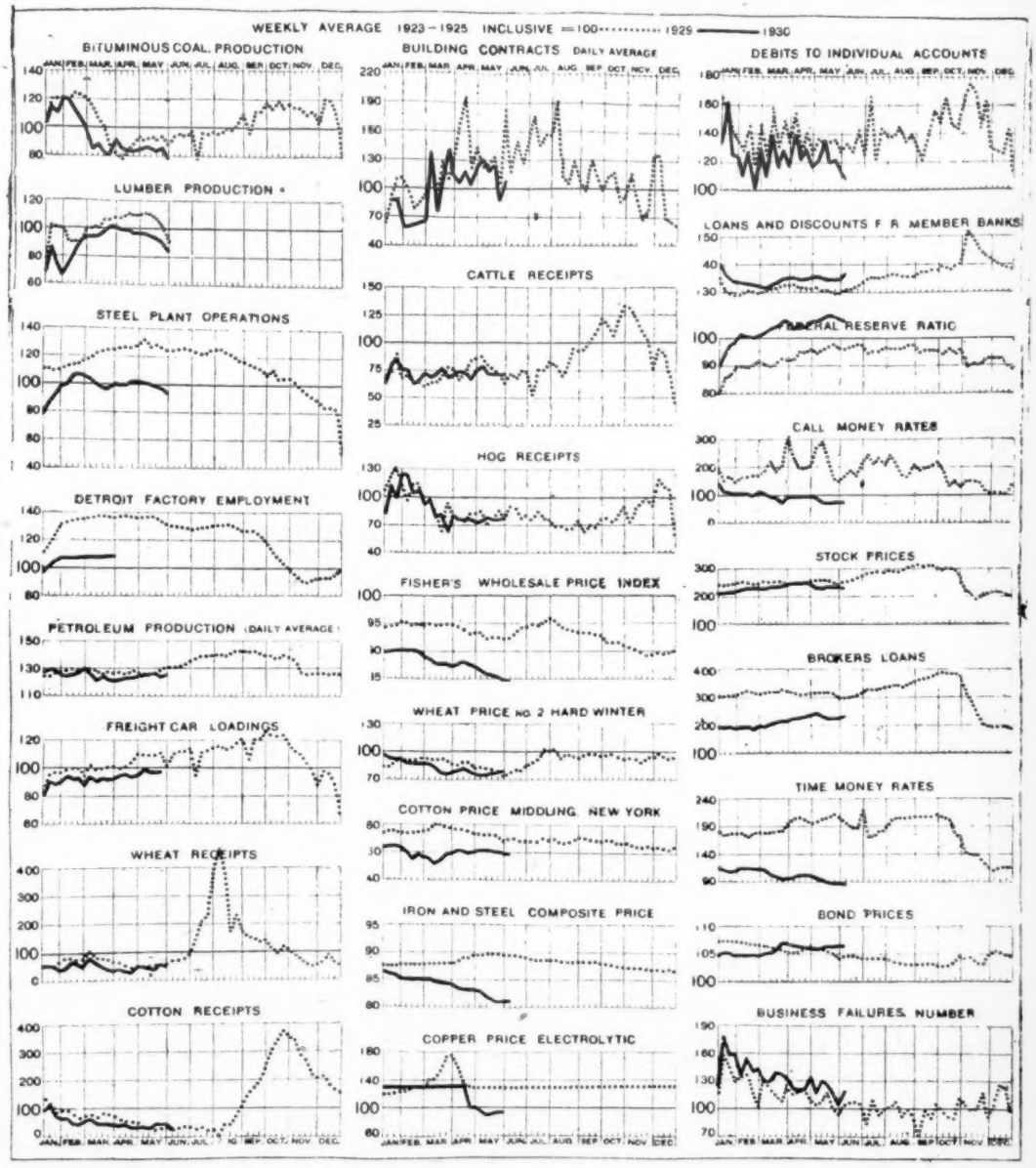
Speaking at the summer meeting of the bankers' organization in Quebec, Mr. Lonsdale remarked: "If our big national issues such as the tariff, for instance, could be removed from political control and placed in the hands of impartial investigators and advisers who have no campaign pledges to keep, we eventually would have a measure to which we could point with pride. In its present form the tariff bill does not satisfy the people and I am certain it is a disappointment to our basic industries, including agriculture."

Then Mr. Lonsdale asked his banker hearers: "Is it the part of wisdom at this time to provide increases which will react unfavorably on foreign trade?"

We quarrel with Mr. Lonsdale's question in just one particular. Instead of using the words "will react unfavorably," he could better have said "have already reacted unfavorably on foreign trade."

In the same paper that carried the text of the bankers' president's speech, appeared an item which announced that automotive exports for April, 1930, totaled $37,443,661, as compared with a record of $66,686,635 for the same month in 1929. We may profitably ponder just how much in wages, commissions and general employment was lost to this country by this reduction of nearly $30,000,000 in a single month's automotive shipments to foreign nations. Reprisals are already in effect and unless we are purblind we can judge of the effect that this Hawley-Smoot measure will have if it actually becomes a law.

U. S. Charts Week's Business Progress



Above is reproduced this week's chart of business trends issued yesterday by the Department of Commerce at Washington. These charts are now appearing regularly in Automotive Daily News.

Cook County's Five Months' New Car Sales Off 15.7%

CHICAGO, June 12.—New car registrations in Cook county for five months were 15.7 per cent. below those of the same period last year. There was a gain, however, over the first five months of 1928.

Total listings for the period this year were 44,779, as compared with 53,146 for 1929 and 39,209 for 1928.

Ford led by a large margin and was one of the few makes to show a gain over the preceding year. The Ford comparisons were 16,988 for this year and 12,540 for last. Chevrolet, in second place, totaled 6,767 as against 7,321 for 1929. Buick was third with 2,592, sustaining a slight individual loss from last year. With Marquette, Buick led the groups having a combined total of 2,766, which compared with Buick figures of 2,661 last year.

There was a reversal of positions between Pontiac and Essex from 1929, the former leading this year with a total of 1,658, Essex having 1,370. Last year Essex took third place with 3,317 and Pontiac had 3,167 for fourth.

Combined with Hudson, Essex had 2,104 for this year, compared with 4,715 last year, and the Oakland-Pontiac combination had 2,373 for 1930 and 3,886 for last year.

Other groups registered the following: Oakland-Viking, 1,381 for 1930 and 1,589 for 1929; Studebaker, Erskine, 1,157 for 1930 and 1,922 for 1929; Willys products, 792 for 1930 and 1,946 for 1929; Cadillac-La Salle, 774 for 1930 and 1,332 for 1929; Auburn-Cord, 515 for 1930 and 725 for Auburn in 1929; Marmon-Roosevelt, 323 for 1930 and 336 for 1929, and Stutz-Black Hawk, 76 for 1930 and 121 for 1929.

Erskine scored an individual gain of 270.6 per cent., Franklin 48.9 per cent., Peerless 23.7 per cent., Pierce-Arrow 21.8 per cent., Marmon 8.8 per cent., Gardner 52.7 per cent., Viking 53.4 per cent. and Black Hawk 44.4 per cent.

General Motors units had a combined loss of 3,128 cars for the period. The totals were 16,989 for 1929 and 13,861 for this year. The Chrysler group had 4,655 last year and 3,763 for 1930.

The standing for the five months this year with 1929 comparisons follows:

	1930	1929
Ford	16,988	12,540
Chevrolet	6,767	7,321
Buick	2,592	2,661
Pontiac	1,658	3,167
Essex	1,370	3,317
Chrysler	1,356	1,601
Oldsmobile	1,292	1,531
Nash	1,222	3,246
Dodge	1,116	1,574
Studebaker	879	1,048
Hupmobile	859	1,048
Packard	783	1,358
Hudson	734	1,398
Graham-Paige	693	1,737
De Soto	649	757
Plymouth	642	723
Oakland	515	919
Willys 6-Whippet 4	505	1,317
La Salle	473	668
Auburn	400	725
Cadillac	301	664
Willys-Knight	287	629
Erskine	278	75
Franklin	271	182
Lincoln	249	334
Reo	245	379
Peerless	240	194
Roosevelt	200	223
Durant	189	254
Marquette	174	..
Pierce-Arrow	162	133
Marmon	123	113
Cord	115	..
Gardner	110	72
Viking	89	58
Moon-Windsor	66	74
Stutz	50	103
Jordan	33	46
Blackhawk	26	18
Miscellaneous	78	140

LAKEY FOUNDRY REPORTS NET PROFIT OF $37,037

Detroit, June 12.—Lakey Foundry and Machine Company reports for the six months ended April 30, 1930, a net profit of $37,037, after charges and Federal taxes, equal to 12 cents a share on 315,025 shares of no-par stock.

COMING EVENTS

JUNE

23-26—**San Francisco, Cal.** Meeting American Electric Railway Association.
23-27—**Atlantic City, N. J.** American Society for Testing Materials annual meeting at Chalfonte-Haddon Hall.
26-28—**White Sulphur Springs, W. Va.** Steel Founders Society summer convention.
29-July 13—**Posen, Poland.** International Motor and Transport Show.

AUGUST

26-28—**Chicago, Ill.** Society of Automotive Engineers aeronautic meeting in conjunction with National Air Races.

SEPTEMBER

22-26—**Chicago, Ill.** American Society for Steel Treating meeting at Stevens Hotel.
29-Oct. 4—**Pittsburgh, Pa.** National Safety Council Annual Safety Congress.

OCTOBER

2-12—**Paris, France.** Automobile Salon.
6-11—**Washington, D. C.** Sixth International Road Congress.
6-11—**Washington, D. C.** American Roadbuilders' Association Convention.
8-9—**Detroit, Mich.** Society of Automotive Engineers production meeting at Book-Cadillac Hotel.
22-24—**Pittsburgh, Pa.** Society of Automotive Engineers' transportation meeting.
16-25—**London, England.** Olympia Motor Show.

NOVEMBER

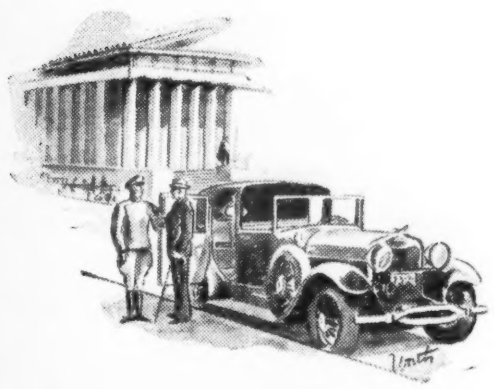
6-16—**Berlin, Germany.** International Automobile Show.
8-15—**Chicago, Ill.** Automobile Salon at Drake Hotel.
10-14—**Cleveland, O.** Motor and Equipment Association Show.
17-21—**Cleveland, O.** National Standard Parts Association Show.
30-Dec. 6—**New York.** Automobile Salon at Hotel Commodore.

DECEMBER

6-17—**Brussels, Belgium.** Automobile Exhibition.

JANUARY

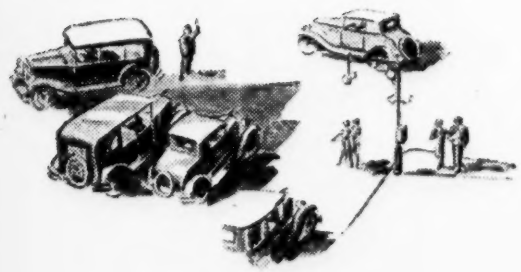
3-10—**New York.** National Automobile Show.
24-31—**Chicago, Ill.** National Automobile Show.



Unwilted by Wall Street

TODAY

the masses are buying most cars



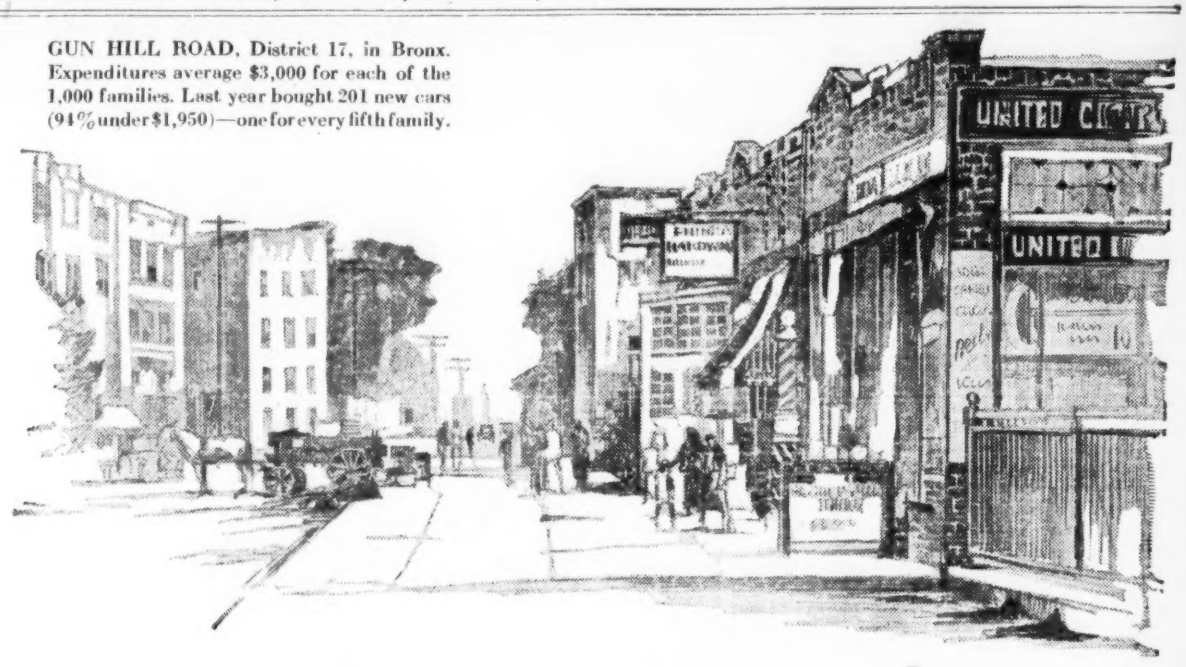
THE NEWS

New York's Picture Newspaper

220 EAST FORTY-SECOND ST., NEW YORK

Tribune Tower, Chicago—Kohl Bldg., San Francisco

GUN HILL ROAD, District 17, in Bronx. Expenditures average $3,000 for each of the 1,000 families. Last year bought 201 new cars (94% under $1,950)—one for every fifth family.



QUERIES a Detroit Sales Manager: Your analysis of actual registrations proves that middle-incomed city districts bought most new cars *last year*—but what about mass buying in 1930?

Mass districts are now cutting a bigger slice of the sales pie than ever before. Registration analysis shows that the staple middle-class, with current purchasing power unwilted by Wall Street, rose in car-buying importance during the first four months of 1930, while upper registers fell. Facts follow . . .

Districts averaging	*bought 1929*	*all cars 1930*	*bought 1929*	*under $1,950 1930*
$5,000 and up	22.8%	21.5%	19.7%	17.7%
$4,000-$4,999	22.9	21.8	23.1	21.9
$2,000-$3,999	50.7	52.9	53.5	56.4
Under $2,000	3.6	3.8	3.7	4.0

The $2,000-$3,999 group is definitely UP!

To-day's volume customers live in mass neighborhoods. From January through April 1930 they bought 56% of all cars under $1,950—88% of cars sold here—and, to get down to cases, took 59.5% of De Sotos (55.4% last year), and 53.4% of Willys-Knights (49.6% last year). Good customers last year, better to-day!

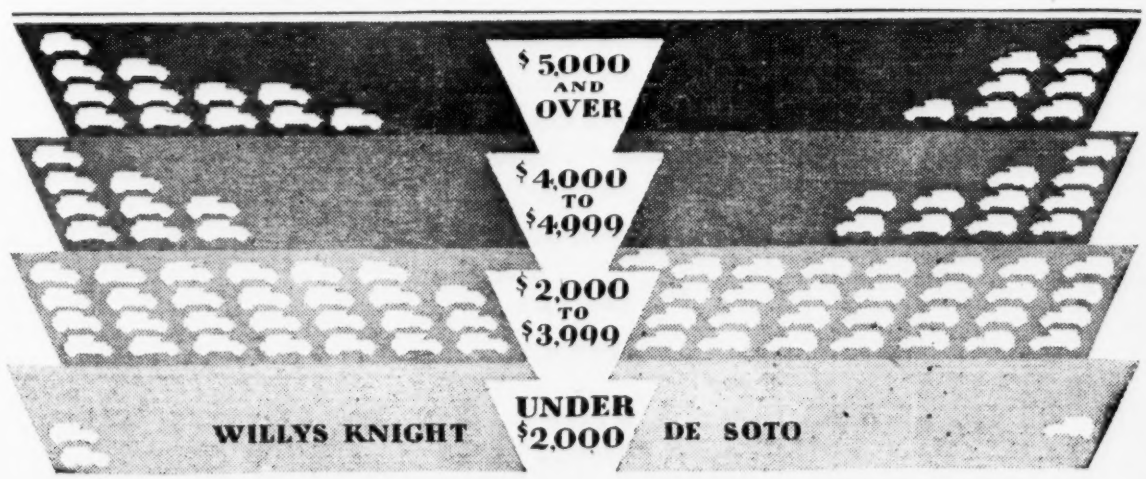
These statements are *fact-founded.* Our Research Department allocated every new car sale to districts of known purchasing power. The study is nobody's secret, and will be shipped free to interested executives.

AND because mass buyers are giving more 1930 business, they merit more mass merchandise, more concentrated advertising attention.

Yet the two most used morning papers have less than one-quarter of their circulation in middle-class districts—one paper reaches only 7% of families, the other only 11%.

The News, on the other hand, concentrates 45% of its circulation in high volume districts, reaches 589,000 middle-incomed families—*seven in ten!* Covers an additional quarter-million in over-$4,000 city districts, and more in the suburbs than any other paper. Tells sales stories nearly a million and a quarter times daily within fifty miles. Tells them better because small pages, fitting eye focus, double attention value by halving the field of vision. And costs decidedly less. For mass-buying 1930, consider The News!

WILLYS-KNIGHT last year made 49.6% (*53.4% this year*), DE SOTO 55.4% (*59.5% this year*) of New York City Sales in $2,000-$4,000 districts



$5,000-and-over districts furnished 25.0% of Willys-Knight sales—16.4% of De Soto sales
$4,000-$4,999 districts furnished 18.0% of Willys-Knight sales—21.8% of De Soto sales
$2,000-$3,999 districts furnished 53.4% of Willys-Knight sales—59.5% of De Soto sales
Under $2,000 districts furnished 3.6% of Willys-Knight sales— 2.3% of De Soto sales

Source: The News 1930 New Car registration analysis

Production--Engineering--Factory-

Meet the Chief Engineers

TO acquaint its readers with the important, but unsung, members of the automotive fraternity—the engineers who design and build the nation's cars—Automotive Daily News is publishing a series of brief biographies of the chief engineers of companies producing automobiles, automotive equipment, parts and accessories. These biographies will cover the training and experience of leading engineers and their outstanding contributions to the progress of our industry.

H. C. SNOW

H. C. Snow, chief engineer of Auburn Motor Automobile Company, was born in Cleveland, O., and received his technical education at Case School of Applied Science, Cleveland. He started in 1904 as a draftsman with the American Ball Bearing Company, Cleveland, which was one of the first specialists in the manufacture of automobile axles. The following year he was working as a detailer and designer with the Garford Manufacturing Company of Elyria. At that time the Garford company was building complete chassis for the Cleveland, Rainier and Studebaker companies.

Leaving there early in 1906, he jointed the engineering department of the Peerless Motor Car Company, and for the next six years was, successively, designer and chief draftsman.

In 1912 he went to the Willys-Overland Company of Toledo, O., as assistant chief engineer, where he remained until the end of the following year.

Returning again to Cleveland in 1914 he became designer and experimental engineer for the Winton company. He remained with this company for seven years, during which time he rose to the position of chief engineer.

Leaving the Winton company in 1921 he did considerable consulting engineering work for the next three years, the greater part of this being in the East.

In January, 1924, he became chief engineer of the Velie Motor Car Company, Moline, Ill. He remained there until July, 1927, leaving to become chief engineer of the Auburn Automobile Company.

Mr. Snow has been very active in the work of the S. A. E., having served as chairman of the Cleveland section in 1919. In addition, he has been a member of several divisions of the standards committee.

Marmon Cars Equipped For Radio Installation

ANNOUNCEMENT has been made by the Marmon Motor Car Company that radio receiving apparatus now is available for installation on each of the company's four lines of straight-eight automobiles.

Installation of radio equipment on new cars will be made at the factory or complete sets will be supplied Marmon distributors and dealers by the factory accessory division. A special set with counterpoise ground wire has been developed for use on Marmon models not equipped with aerial wiring.

Products of well-known radio manufacturers have been specially adapted for use on Marmon cars and a period of nearly a year was spent in developing the installations to a high point of efficiency. Each of the sets carries a ninety-day warranty from the manufacturer, in addition to a one-year guarantee on tubes.

Two separate methods of installation are used, with the set located either under the hood or on the dash inside the car. Controls are operated from a special panel mounted on the dash, within easy reach of the driver or front-seat passenger. Radio sets supplied by the factory consist of complete radio receiving apparatus, including tubes, batteries and loud speaker, ready for installation and immediate operation.

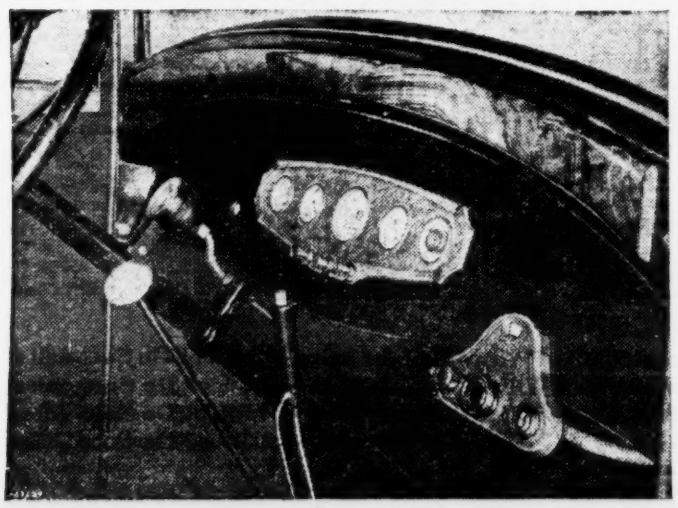
In commenting on the announcement, Thomas E. Jarrard, Marmon general sales director, said: "The tremendous popularity of radio has set up an insistent demand for satisfactory receiving installation in automobiles, and our distributors and dealers now have an opportunity to profit from radio sales. Results obtained from the sets offered by Marmon have been highly successful, and we believe that our engineers have developed receiving apparatus which will give results quite out of the ordinary.

"A wide variety of sets were tested before our selections were made, and our announcement of radio equipment was withheld until experimental work had been completed to improve selectivity and tone quality to its present high point. We believe that radio installation will be a sales advantage as well as a source of profit to our distributors and dealers."

NORTHWEST SECTION S.A.E. TO VISIT POWER STATIONS

Seattle, Wash., June 12.—C. H. Bolin, secretary of the Society of Automotive Engineers, Northwest Section, has sent final notices to members of the summer visit to the Skagit hydroelectric project in northwestern Washington, where the city of Seattle is developing power plants. Two days will be required for the trip. Date, June 21 and 22.

The Automotive Maintenance Association of King County will also make the Skagit trip, the date being July 9, this to take the place of the annual picnic and outing.



STUDEBAKER WIRES CARS FOR RADIOS

Studebaker President Eight and Commander Eight closed models are now wired for radio installation, according to J. M. Cleary, Studebaker sales manager.

"The aerial is concealed in the roof of the car. The lead-in wire is also concealed, being carried from the aerial to the instrument board through the left front body pillar. To this wire the radio receiving set may be connected.

"Precautions have been taken to make this antenna 'leak-proof.' All wires are insulated. Wherever metal touches metal in such a way that a ground might result, adjoining parts are thoroughly insulated with heavy rubber tape.

"The metal roof cross braces are also completely covered with this insulation, as are the steel braces which support the side panels of the body. Painstaking care and sturdy installation insure efficient radio reception."

New Type Barrel Pump For Oil Trade

The Aldicas Corporation, Long Island City, N. Y., has recently placed on the market a small transfer pump for barrel and oil drum use. This pump is of unique design and is made in two style, type 101 with ordinary discharge pipe or nozzle, and type 102 with a non-drip nozzle, for which patent has been applied and which the manufacturers claim is really the only "non-drip" nozzle on the market today, in that while other styles of "non-drip" nozzles actually do drip to more or less extent, the Aldicas nozzle is positive in its work, the instant the user of the pump ceases to operate it not a drop more liquid escapes.

Another advantage claimed for the Aldicas barrel pump is the construction of the cylinder and base, these being die cast in one piece, doing away with lugs and side rods to hold the cylinder and caps together. There is no leather cup on the piston as is usually found in competitive types, the Aldicas being furnished with a regular piston ring as used in engine or motor pistons.

The Aldicas pump is packed in separate cartons complete, and has a parcel post weight ready to mail of only nine pounds, this being a distinct advantage in a saving of postage and a shipment by mail in one package only.

Salt Spray Tests Insure Against Rust

Dodge Brothers' metallurgists have devised and have been using for some time what is known as the salt spray test. In a specially constructed booth, parts taken at random from factory production are submitted to the corrosive action of a mist of salt that represents in concentrated form what a car endures when used regularly at the seashore, where it is constantly exposed to the salt-laden ocean breezes.

A saturated solution of sodium chloride or common salt is pumped under pressure through small jets or orifices, which act as atomizers. The resulting spray is many times more penetrating than natural ocean mist because of the greater content of salt in the solution and also because of the pressure built up in the booth. Although double doors, the outer one of immense thickness, are used on the salt spray room, the penetrating solution finds its way through infinitesimal openings that otherwise would be imperceptible to the naked eye.

CHRYSLERS WIN RACING CLASSICS OF MEXICO

Puebla, Mexico, June 12—Winning two firsts and a third in three classes, Chrysler cars established a unique record in the recent Mexico City to Puebla road races. Over 74 miles of winding mountain roads, a Chrysler "77" roadster negotiated the distance in 1 hour, 9 minutes and 21 seconds, clipping 3 minutes, 2 2-5 seconds off the previous record time held by a Chrysler "72." A Chrysler "66" won the Class B event by traveling the same distance in 1 hour, 16 minutes and 51 seconds. In the Class C event, a Chrysler six sedan finished third with a recorded time of 1 hour, 22 minutes and 53 seconds.

New 'You Auto Signal' Marker

A NEW type of direction signal has been placed on the market by the You Auto Signal Company of Fort Lauderdale, Fla.

Operated from a control case at the hand of the driver by three buttons, a left, right or stop signal is given at the upper left corner of the rear light, where the makers claim the greatest visibility exists for the car following.

The You Auto Signal has three signal blades, two of them being arrows for the left and right signals and the third is the word "STOP." The case containing the blades is attached inside the car next to the rear window. The signals are operated by pushing the buttons in the control case, which is so mounted that the hand does not have to be taken from the steering wheel. Signals can be given with the windows closed or opened, and when the signal is operated a light is automatically flashed upon it so that it is visible night or day. Easily installed as it is, it is not necessary to remove any parts or bore any holes.

Ford Installs New Steel Ingot Conveyor System

The Ford Motor Company has recently placed in operation a conveyor sufficient in size to accommodate 250 red-hot ingots at one time. To keep it adequately supplied, special electric crane equipment has been designed which lifts four ingots in a single operation and places them in the conveyor. So far as Ford engineers know, both the conveyor and the quadruple lifting machinery are unique in steel plant practice.

The special Ford type of fluted steel ingot is formed at the Rouge plant, Dearborn, Mich., by casting the molten metal into cylinder-like molds. These molds have corrugated interiors, which taper slightly toward the bottom. The metal is let into the molds as they stand upright on cars and then allowed to remain undisturbed until the molten steel has changed from the fluid state into solid ingots.

Following an operation which loosens them in the molds, the ingots are ready to be transferred from the molds to the "soaking pits," where they will be brought up to a temperature sufficient to allow them to be shaped into billets in the rolling mill.

Prior to the installation of the new conveyor and multiple lifting machinery, the practice was to let the ingots stand in the molds until needed. Then a battery of cranes, working above them, removed one ingot at a time. This method often resulted in confusion of operation, loss of time and heat, and, moreover, held up the mold train. Ford engineers, always watching for opportunities to reduce costs so that the results can be passed on to the motoring public, began studying this condition. They decided that the conveyor system that had made possible the mass production of automobiles could also be utilized in the handling of ingots.

So they designed, and then erected, parallel to the mold train track, an endless conveyor, five hundred feet long and sixteen feet high. Located at either end of the massive steel frame, which gives body to the entire structure, are huge sprocket wheels. Extending across the top of the structure a track connects with the driving gear near the tops of the two wheels, while a similar track connects in the same manner near the bottom of these wheels. Thus the conveyor chain travels a somewhat elliptical course. This chain, or steel belt, is composed of segments, something after the principle of a metal wrist-watch band. Every segment, of which there are a total of 258, supports two pot-like receptacles, each pot of sufficient size and depth to hold an ingot in an upright position.

To provide for the quick and economical supplying of the conveyor, a quartet of grasping tongs was designed. These iron hands are suspended from the bottom of a ten-ton electric crane of the overhead type. Automatically operated by the pilot of this aerial engine, these hands of iron fasten to the necks of the ingots, lift them, four at a time, from the molds and deposit them in conveyor pots.

Three electric cranes are still retained at points convenient to the soaking pits, but instead of fishing for ingots, one at a time, as was formerly the case, the new conveyor automatically places an adequate supply at their immediate disposal. When ingots are needed to replenish any of the thirty-six soaking pits that have been emptied by the dispatching of the reheated ingots to the steel mill, these smaller cranes go into action. The tongs with which each is provided then reach out to a conveyor pot with as much ease as you at your desk might reach out for the brush in a paste pot.

Since each ingot supported by the conveyor weighs 1,720 pounds, the danger of breakage to the pots is minimized by cradling each of them upon a quartet of powerful spiral springs. To make for smoothness of operation and lower operating costs, the entire conveyor runs upon roller bearings. It is electrically driven and capable of transporting more than four million pounds of ingots at one time.

SMALL PLANT SUCCESS DISCUSSED BY A. S. M. E.

(Continued from Page 1)

economical to manufacture an article at a minimum cost.

"It has become evident that the small plant may penalize itself by trying to manufacture an article at minimum cost in competition with large mass production plant. Schedules should be arranged so as to require the smallest average investment of capital," he said.

STOCK STUDEBAKER MAKES RECORD CLIMB IN CALIFORNIA

Danville, Cal., June 12.—Smashing all existing records, a stock Studebaker Six sedan, piloted by Ralph Hepburn, climbed to the summite of Mount Diablo, famous scenic mountain near here, in 21 minutes, 39 3-5 seconds. The run of 11.6 miles, rising to an elevation of 3,849 feet, was clocked by a committee of four newspaper men from San Francisco and Oakland.

Equipment - - - Development

Large Plant Management

This paper on plant management was presented at the semi-yearly meeting of the American Society of Mechanical Engineers, in Detroit this week. The paper will appear serially in Automotive Daily News and the first installment is published herewith.

By A. B. REYNDERS,[1]

Springfield, Mass.

Experience shows that one man cannot efficiently supervise more than ten others. Each assistant should have definite duties and responsibilities in order to become a regular superintendent or foreman. A carefully planned organization with clearly defined duties for each position will accomplish much, but the selection of proper men is of great importance. The success of a small concern depends almost entirely upon its personnel. As the organization grows its functioning consumes more time, and a large corporation must function through written instructions.

A large plant has the advantage of quantity production and can also obtain the advantages of the small plant by careful attention to details. The advantages usually considered as resulting from a small plant are, quick action, low production cost of small quantities, and close relationship of employee and employer. The paper discusses each of these, and outlines methods of obtaining them in large organizations.

The sole object of any manufacturing plant is to make money by rendering a legitimate service. Some may think that they are in business to maintain a reputation, to produce wonderful engineering feats, to give employment to a small or a large number of employees, but in the final analysis, unless they are operating a charitable or a governmental institution, they must make a monetary return on the invested capital or else, ultimately, cease to do business. Whether a large or a small concern, this is true. How it is accomplished varies. In a small company this responsibility is directly assumed by the owners. In a large concern, the owners, commonly called stockholders, are many, and the responsibility for results is delegated to an employed organization. The control or direction of this organization to obtain the desired results is known as management.

The form of an organization is of vital importance to its functioning. If it is not set up properly, the management will be inefficient.

The larger the organization, the more necessary it is that all activities be covered, that the duties and responsibility of each individual in charge be definitely fixed. Overlapping of duties causes confusion with resultant loss of time and costly errors.

A large manufacturing enterprise would do well to pattern its form of organization somewhat after the oldest organization in the world, the army. It has its line for fighting, its staff for advice and co-ordination and its councils for specific tasks. Long experience has shown that one man can, with efficiency, personally supervise the efforts of not more than ten men.

In a large industrial corporation the owners or stockholders elect a board of directors, the board of directors elect the officers, and the officers, in turn, appoint the managers, the supervisors, and so on down the line. Graphically, this may be described as an "hour glass" type of organization, starting with a large number of owners concentrating in a chairman of the board, or president, and then expanding to cover various activities. In general these activities are centered about three major divisions, selling, designing, and manufacturing. In addition, there are various allied activities, such as the financial department, the legal department, the accounting department, the credit department, etc. This constitutes the line. Certain officers of the corporation, such as the vice-president in charge of manufacturing, require a staff of experts to advise the managers of the different plants or to co-ordinate their efforts. In addition, various committees are formed from time to time to perform certain functions, such as welfare committees, safety committees, etc.

Just as in the army, such an organization will be found to function best when one officer or supervisor personally directs not more than ten men. Here the author wishes to make a statement which has been the result of some years of observation. Every assistant should have definite duties and responsibilities. If he has duties assigned to him from time to time by his immediate superior he either becomes a glorified secretary or else he assumes authority and runs the job. In both cases he is a misfit. An assistant with definite duties becomes a regular executive such as a superintendent or a general foreman. A carefully planned organization with clearly defined duties for each position will accomplish much, but the selection of the proper men is of the greatest importance. In fact, the success of a small concern depends almost entirely upon its personnel. Many a poor organization functions because of the high grade men directing it.

From now on the remarks will be confined to certain features of factory management only, as an attempt to cover all activities of the corporation would have the effect of an anesthesia on the most alert of readers or listeners. Such activities as executive control, sales, engineering, legal, research, etc., will only be mentioned briefly in relation to the works. However, before proceeding on factory management, it would be well to define what is meant by a large plant and what is meant by a small plant. Such terms as "large" and "small" are relative. Another speaker has thoroughly covered the subject of size from several points of view. For the purpose of this paper let us use the number employed as a basis for classifying a plant as large or small; a large plant having 1,000 or more employees; less than 1,000 employees being considered small.

(To Be Continued)

[1]Works Manager, Westinghouse Electric and Manufacturing Company—Contributed by the management division for presentation at the semi-annual meeting, Detroit, Mich., June 9 to 12, 1930, of the American Society of Mechanical Engineers. All papers are subject to revision.

Note—Statements and opinions advanced in papers are to be understood as individual expressions of their authors, and not those of the society.

Stresses in Rotating Disks Are Carefully Studied

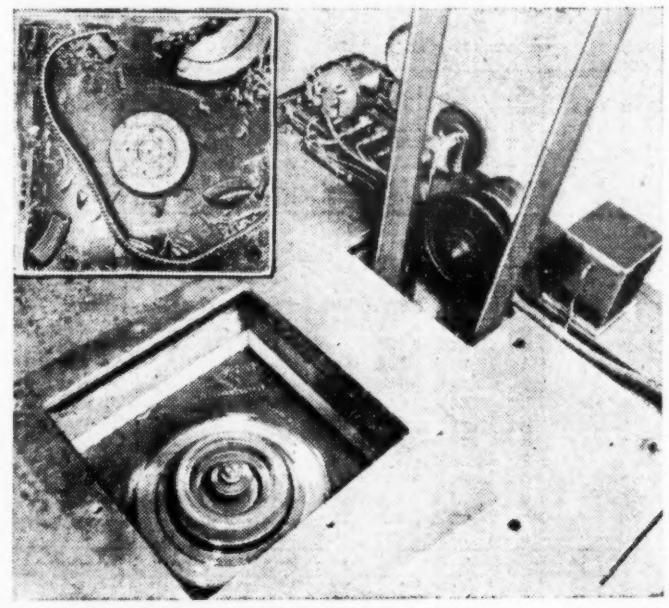
Thomas H. Frost, assistant professor of the department of physics of the Massachusetts Institute of Technology, and K. F. Whitcomb, research laboratory of the Norton Manufacturing Company, Worcester, Mass., collaborated on this paper on the "Stresses in Rotating Disks," which was presented at the semi-yearly meeting of the American Society of Mechanical Engineers at Detroit this week.

This paper comprises the results of a photoelastic investigation, sponsored by the Norton Company, of the stresses in rotating disks. The classical theory of Chree, with a few additions, is presented, and the results of the experimental determinations are compared with the theory as well as actual breakages of vitrified wheels.

The object of the investigations described in the present article has been to determine, by photoelastic experimentation, the stress distribution in rotating disks of constant external but varying internal diameter and to compare the results obtained with the existing classical theory and actual practice.

The practical consideration which suggested the work was the modern demand for higher grinding-wheel speed as an effective means of increasing production. Since engineers are not agreed on relative speeds, with equal safety, as wheel dimensions are varied, it was felt that a more complete understanding of stresses and their causes would be of great value in the design of wheels as well as in the specification of higher, but safe, operating speeds.

In order to obtain some idea as to what stresses exist in a rotating disk the following solution on rotating isotropic disks, by Chree,[2] is given. This solution, based on the theory of elasticity, is most generally accepted as being the correct one. A few additions to Chree's paper, such as diagrams showing the stress forces and the strains, have been made.



Dry Quenching of Coke Discussed at A. S. M. E. Meet

"The Dry Quenching of Coke" was the title of a paper presented at the semi-yearly meeting of the Society of Mechanical Engineers in Detroit this week by William O. Renkin, engineer of the Dry Quenching Equipment Corporation, New York.

This paper describes the process of dry quenching or cooling of coke with automatically formed inert gases, the sensible heat in the glowing coke being used to heat the cooling gases, which in turn pass through boilers, producing steam at useful pressure and economic cost without the consumption of any other fuel. Formulas, curves and data regarding heat available and method of calculation are given, together with descriptions of installations and illustrations of plants in operation.

A detailed economic study is given by months for the year 1929 are included.

Analyses of coal and coke are given, which show conclusively that dry-quenched coke carries less dust than wet-quenched coke.

Data giving actual results obtained by using dry-quenched coke in blast furnaces and the advantages of substituting dry-quenched coke fines for high-priced bituminous gas coal in gas producers are discussed in considerable detail.

A dry-quencher plant at a power station in Flint, Mich., the latest to be installed, is described in some detail and the principal technical data given.

which shows the savings to be expected and the approximate cost of a dry-quencher plant to cool 1,500 net tons of coke per day, and composite charts giving actual operating records as well as output data and the cost of power for one plant

Stresses and Deflections of Springs Affected by Curvature

This report, read at the semi-yearly meeting of the American Society of Mechanical Engineers in Detroit, was prepared by M. F. Sayre, supervisory member in charge of research at Union College and associate professor of applied mechanics, Union College, Schenectady, N. Y. It gives the experimental results of an investigation conducted at the committee's research station at Union College, Schenectady, of the effects of relatively sharp curvature on the stress and deflection of curved beams such as would be used in torsional springs, stressed in bending. The results which were obtained with spring-steel bars of rectangular cross section give such remarkable confirmation of the curved-beam theory as to justify the application of theoretically deduced correction factors to the formulas regularly used for the calculation of maximum stress and deflection in springs of the curved-beam type. In springs of sharp curvature the correction for maximum stress is as high as plus 30 per cent., while for deflection it is only minus 3 per cent.

Many of the most common types of flexual springs and all torsionally loaded springs, including those of the helical and spiral types, belong in the general class of curved beams. Due to the curvature, stress conditions in such beams are worse than in an initially straight beam with equivalent loading, the excess stress reaching as high as 30 per cent. in sharply curved springs. The magnitude of this increase in stress has been known to designers of rigid-beam construction for some time, but it is only recently that practical formulas for the calculation of maximum stress and deflection in torsionally loaded springs, taking into account the effect of curvature, have been published.

With the purpose of providing full confidence in the accuracy of the correction factors for curvature it was decided to conduct an experimental investigation of the effects of curvature on stress and deflection. The experimental procedure, in a measure, paralleled the investigation of the effect of curvature upon torsional stresses in heavy, closely coiled helical springs made by A. M. Wahl[3] and reported under the auspices of the committee in December, 1928, but covering those springs which are stressed in bending rather than in torsion. The present report, therefore, contains the results of experimental work carried on in order to check the validity of the new formulas for torsionally loaded springs, stressed in bending. The paper is a comprehensive mathematical discussion.

RIGOROUS TESTS INSURE SAFETY IN DE SOTO FLYWHEELS

A TESTING WELL has been built by the De Soto Motor Corporation, in which sample flywheels can be whirled until they explode by centrifugal force. The flywheels rotate at tremendously high speeds to see that they are provided with ample safety factors. In order to protect the safety of those conducting the tests, the flywheel is placed in a well or pit beneath the level of the floor, and there is a steel coverplate bolted over it while it is tested.

The flywheel is rotated by a machine, while a measuring device records the speed in revolutions per minute. As the speed goes higher and higher, the operator watches the dial. Finally there is a bursting sound, and the driving power is automotically cut off. The flywheel has been exploded. The heavy, hardwood timbers with which the pit is lined are scarred and splintered with the bursting fragments thrown off in these tests.

If a flywheel bursts at 16,000 revolutions per minute (and engine speeds connot possibly go higher than 4,000 revolutions per minute), it does not mean that the flywheel is four times as strong as need be, but sixteen times as strong, because the stresses go up with the square of the speed. A factor of safety of sixteen is very ample and higher than is necessary. In the flywheel and clutch assembly tests the bursting speed is so high above normal requirements that no danger of flywheels failing in service will ever arise, the makers state.

Flow of Gases Exceeding the Acoustic Velocity

This paper, reprinted in part herewith, was prepared by O. G. Tietjens, research department, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., and was presented at the semi-annual meeting of the American Society of Mechanical Engineers at Detroit this week.

The paper deals with the flow of gases at high velocities, that is, at velocities exceeding the velocity of sound in the gas under the existing conditions of tempertaure and pressure. The discussion starts with the development of the fundamental equations of flow and shows why the acoustic velocity assumes such critical importance. In particular, the flow of gas through a De Laval nozzle is considered, the natural assumption of adiabatic flow being made. The so-called compression shock is discussed and the conditions under which these shocks occur, their connection with the acoustic velocity, and their effect on the flow through the nozzle, are pointed out.

It is well known that gases and steam change their behavior completely as soon as their velocities exceed the acoustic velocity. This happens in several cases. Not only does the velocity of flow in steam and gas turbines almost always exceed the acoustic velocity, but in internal-combustion engines, especially in the flow through the valves and into the cylinders, this condition also exists. In addition, the behavior of gases in explosions has to be mentioned in this connection. Here the velocities are usually extremely high, in some cases twenty times the acoustic velocity, and even higher. Also many phenomena in the extensive field of ballistics come under this classification.

The theoretical treatment of flow at velocities far below the acoustic velocity is widely known, especially the application of the Bernoulli equation and the equations of the potential theory. However, this cannot be said of the theoretical treatment of high-velocity flow. The statement that the acoustic velocity connotes a sort of limit velocity is often loosely adopted without a clear idea as to just why the acoustic velocity plays this role.

It is hoped, the author states, that this paper may contribute to broadening the knowledge of this interesting and important part of aerodynamics. In this field Dr. L. Prandtl at the University of Gottingen has been one of the outstanding contributors, and on his lectures there much of this discussion is based. To make its perusal easier, reference to other papers or text books, which might somewhat shorten the text, are intentionally omitted. Instead, it is attempted to develop from the very beginning the fundamental formulas with the simplest use of mathematics possible, and in particular to apply these formulas to the flow through a nozzle as an example.

CHAFFIN CO. TO PRODUCE NEW STYLE CARBURETOR

Ironton, O., June 12 (UTPS).—The Chaffin Manufacturing Company, recently organized, has taken over a manufacturing plant on Lawrence Street, here, in which will be installed equipment to manufacture a new style carburetor invented by Daniel Chaffin. The officers of the company are A. G. Howards, president; John H. Smith, vice-president; A. G. Hague, secretary-treasurer, and E. G. Atkins, general manager. The plant will be started in a few weeks.

MAJOR SPECIFICATIONS AND MECHANICAL DETAILS OF

Make and Model	Capacity—Tons	Chassis Price	Engine	No. of Cyl.	Bore and Stroke	Tax H. P.	Oil System	Carburetor	Fuel Feed	Ignit. System	Gear Set	Location	No. Spds. For.	Rear Axle	Final Drive	Reduction in Low	Brakes, Foot	Brakes, Hand	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Rear
Am. La France Chief	2	3650	Own	6	3 3/4x5	33.0	Pw	Str	Vac	DR	Own	C	4	Tim	Wo	31.2	4	D	156	6200	32x6	32x6D
Am. La France W	3-4	3950	Own 2 R	4	4 1/4x6	28.9	CS	Zen	Vac	AB	Own	C	4	Own	2R	47.4	4	R	160	7200	S36x5	S36x5D
Am. La Fran. Chieftain	3-4	5500	Own	6	4 1/8x5 1/8	40.8	Pw	Zen	Vac	DR	Own	C	4	Tim	Wo	28.8	4	D	175	7200	S36x8	36x8D
Am. La France V	5	5500	Own 5 R	4	4 3/4x6	36.2	CS	Zen	Vac	AB	Own	C	4	Own	Wo	5[illegible]4	4	R	165	9800	S36x5	S40x6D
Am. La France Z	6 1/2	5750	Own 5 R	4	4 3/4x6	36.2	CS	Zen	Vac	AB	Own	C	4	Own	Wo	63.5	[illegible]	R	165	10000	S36x7	S40x7D
Am. La France U	7 1/2	6000	Own 5 R	4	4 3/4x6	36.2	CS	Zen	Vac	AB	Own	C	4	Own	—	63.5	4	R	165	10500	S36x7	S40x8D
Am. La Fran. Big Chief	6	6725	Own	6	4 1/2x6	48.6	Pw	Zen	Vac	DR	Own	C	4	Own	2R	32.8	4W	D	226	10600	S40x8	S40x8D
Autocar A	1 1/2	2700	Her	6	4 x4 1/2	38.4	Pb	Str	Vac	DR	Br-L 51	U	4	Own SA	Sp	24.3	4	R	150	5060	32x6	32x6
Autocar D	2	3000	Her	6	4 x4 1/2	38.4	Pb	Str	Vac	DR	Br-L 51	U	4	Own SD	2R	30.9	4	R	150	5300	32x6	32x6D
*Autocar H	3	3750	Own	4	4 1/2x5 1/2	32.4	CS	Str	Gra	AB	Own T	U	4	Own H	2R	44.3	R	R	114	6550	34x5S	36x10S
*Autocar SH	3	4300	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Gra	RB	Own T	U	4	Own H	2R	40.5	R	R	114	6770	34x7	34x7D
*Autocar SHA	3	4400	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Gra	RB	Own T	U	4	Own TE	2R	40.5	R	R	138	6770	34x7	34x7D
Autocar SCH	3	4300	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Vac	RB	Own T	U	4	Own H	2R	40.5	R	D	157	6860	34x7	34x7D
Autocar SCHA	3	4400	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Vac	RB	Own T	U	4	Own TE	2R	40.5	R	D	177	6860	34x7	34x7D
*Autocar HS	3 1/2	4100	Own	4	4 1/2x5 1/2	32.4	CS	Str	Gra	AB	Own T	U	4	Own H	2R	44.3	R	R	114	7200	34x6S	36x12S
*Autocar SHS	3 1/2	4800	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Vac	RB	Own T	U	4	Own C	2R	56.2	R	R	114	7900	40x8	40x8D
*Autocar SHSA	3 1/2	4900	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Vac	RB	Own T	U	4	Own TF	2R	56.2	R	R	138	7900	40x8	40x8D
Autocar SCHS	3 1/2	4800	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Vac	RB	Own T	U	4	Own C	2R	56.2	R	D	157	8180	40x8	40x8D
Autocar SCHSA	3 1/2	4900	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Vac	RB	Own T	U	4	Own TF	2R	56.2	R	D	177	8180	40x8	40x8D
Autocar TEA	3 1/2	5350	Own	6	4 1/4x4 3/4	43.4	Pw	Str	Vac	RB	Own T	U	12	Own TE	2R	45.0	4	D	192	8900	36x8	36x8D
Autocar TFA	5	6100	Own	6	4 1/2x4 3/4	48.6	Pw	Str	Vac	RB	Own T	U	12	Own TF	2R	45.0	4	D	192	9300	38x9	38x9D
Autocar C	5	5500	Own	6	4 1/2x4 3/4	48.6	Pw	Str	Vac	RB	Own B	C	4	Own C	2R	46.2	R	D	172	9500	42x9	42x9D
Autocar F	7 1/2	6800	Own	6	4 1/2x4 3/4	48.6	Pw	Str	Vac	RB	Br-L 70	C	7	Tim	Wo	94.0	4	D	173	11000	36x7S	40x8DS
Autocar G	10	9000	Own	6	4 1/2x4 3/4	48.6	Pw	Str	Vac	RB	Br-L 70	C	7	Tim	Wo	97.7	WB	D	171	13000	36x8	36x8D
Brockway 65	1	1195	Con 27 B	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	Aut	Br-L 20	U	3	Col 36000	Sp	21.3	4	Tr	137	3400	30x5	30x5
Brockway 75	1 1/4	1290	Con 27 B	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	Aut	Br-L 20-4	U	4	Col 36000	Sp	25.6	4	Tr	137	3450	32x6	32x6
Brockway 90	1 1/2	1525	Con 27 B	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	Aut	Br-L 20-4	U	4	Col 55000	Sp	25.6	4	Tr	149	3850	32x6	32x6
Brockway JR	1 1/4	1195	Wis C	4	3 3/4x5	22.5	Pb	Zen	Vac	Aut	Br-L 20	U	3	Col 36001	Sp	21.3	4	Tr	130	3100	30x5	30x5
Brockway E 45	1 1/2	1765	Wis S U	4	4 x5	25.6	Pb	Zen	Vac	L-N	Br-L 30	U	3	Col 55001	Sp	21.0	4	Tr	139 1/2	3650	32x6	32x6
Brockway KW	3	4100	Wis H	6	4 x5	38.2	Pb	Zen	Vac	L-N	Br-L 51	U	4	Wis 1228	2R	33.7	R	Dr	170	6920	34x7	34x7D
Brockway R	4	4200	Con L 4	4	4 1/2x5 1/2	32.4	Pw	Zen	Vac	Eis	Br-L 55	C	4	Tim 66600	Wo	46.8	R	R	164	7890	36x5S	36x12S
Brockway RT	4	4850	Con B 7	4	5 x6	40.0	Pw	Zen	Vac	Eis	Br-L 60	C	4	Tim 66700 S	Wo	53.5	RV	Dr	175	8100	36x5S	36x12S
Brockway 120	2	1990	Con 30 B	6	4 x4 1/8	38.4	Pb	Zen	P	Aut	Br-L 35	U	4	Tim 54100	Sp	—	4	Tr	156	5200	32x6	32x6D
Brockway 140	2	2495	Con 30 B	6	4 x4 1/8	38.4	Pb	Zen	P	Aut	Br-L 35	U	4	Wis 4916 L	2R	—	4W	Tr	156	5500	32x6	32x6D
Brockway 290	7	7250	Con 36 B	6	4 3/4x5 3/4	54.15	Pb	Str	P	L-N	Br-L 70-7	C	7	Tim 68703 D	Wo	—	4W	Dr	182	10750	38x7	40x14S
Brockway 640	10	9700	Con 36 B	6	4 3/4x5 3/4	54.15	Pb	Str	P	L-N	Br-L 70-7	C	7	Tim S W 400	Wo	—	4W	Dr	212	14000	38x7	36x10S
Brockway T	5-7	5200	Con B 7	4	5 x6	40.0	Pw	Zen	Vac	Eis	Br-L 60	C	4	Tim 68700	Wo	53.5	R	Dr	175	10065	36x6S	36x14S
Chevrolet	1 1/2	365	Own	6	3 1/8x3 3/4	26.3	CS	Car	P	DR	Own	U	3	Own	Sp	13.61	4	R	107	1835	4.75x19	4.75x19
Chevrolet	1 1/2	520	Own	6	3 1/8x3 3/4	26.3	CS	Car	P	DR	Own	U	4	Own	Sp	33.46	4	R	131	2375	30x5	30x5
Day Elder M F	1 1/4	1345	Con 16-C	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	DR	Br-L	U	4	Tim 52000 H	Sp	24.2	4	D	135	3500	30x5	30x5
Day Elder G F	1 1/2	2050	Con 16-C	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	DR	Br-L	U	4	Tim 54000 H	Sp	28.3	4	D	156	4400	30x5	30x5D
Day Elder H F	2	2500	Con 16-C	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	DR	Br-L 35	U	4	Tim 63702 H	Wo	40.7	4	D	156	4900	S34x4	S34x7
Day Elder J F	3	3900	Con 18 R	6	4 x4 1/2	38.4	Pb	Zen	Vac	DR	Br-L 51	U	4	Tim 65001 H	Wo	41.5	4	D	156	7000	34x7	34x7D
Day Elder K F	4-5	5000	Con 21 R	6	4 3/4x4 3/4	45.9	Pb	Zen	Vac	DR	Br-L 60	C	4	Tim 66702 DH	Wo	55.2	4	D	162	9200	S36x5	S36x12
Day Elder N 6 W	7	6000	Con 21 R	6	4 3/4x4 3/4	45.9	Pb	Zen	Vac	DR	Br-L 60	C	7	Tim SW 200 H	Wo	73.6	6	D	204	10000	34x7	34x7D
Diamond T 200	1	785	Bud	4	3 3/4x4 1/2	22.5	Pw	Zen	P	Aut	W-G	U	4	Cla	Sp	—	4	D	128 1/2	3050	30x5	30x5
Diamond T 215	1	885	Bud	6	3 3/8x4	27.3	Pw	Zen	P	Aut	W-G	U	4	Cla	Sp	—	4	D	135 1/8	3150	30x5	30x5
Diamond T 290	1 1/2	1475	Her WXA 2	6	3 1/2x4 1/2	29.4	Pb	Zen	Vac	Aut	Cov	U	4	Col	Sp	—	4	D	156 1/4	4160	30x5	30x5D
Diamond T 303	2	1745	Her WXB	6	3 3/4x4 1/2	33.7	Pb	Zen	Vac	Aut	Cov	U	4	Tim	Sp	—	4	D	160 3/4	4850	32x6	32x6D
Diamond T 551	2 1/2	2250	Her WXC	6	4 x4 1/2	38.4	Pb	Zen	Vac	Aut	Cov	U	4	Tim	Sp	—	4	D	168	5600	32x6	32x6D
Diamond T 503	2 1/2	2660	Her WXC	6	4 x4 1/2	38.4	Pb	Zen	Vac	Aut	Cov	U	4	Tim	Wo	—	4	D	174	6200	34x7	34x7D
Diamond T 506	2 1/2	2820	Her WXC	6	4 x4 1/2	38.4	Pb	Zen	Vac	Aut	Cov	U	4	Wis	2R	—	4	D	172 1/2	6300	34x7	34x7D
Diamond T 602	3	3440	Her YXC	6	4 3/4x4 3/4	45.9	Pb	Zen	Gra	Aut	Cov	C	4	Tim	Wo	—	4	D	169 1/2	7500	36x8	36x8D
Diamond T 606	3	3500	Her YXC	6	4 3/4x4 3/4	45.9	Pb	Zen	Gra	Aut	Cov	U	4	Wis	2R	—	4	D	186	7500	36x8	36x8D
Diamond T 700	3 1/2	3740	Her YXC	6	4 3/4x4 3/4	45.9	Pb	Zen	Gra	Aut	Cov	C	4	Tim	Wo	—	R	D	162	8100	S36x5	S36x10
Diamond T 801	4	4140	Her YXC	6	4 3/4x4 3/4	45.9	Pb	Zen	Gra	Aut	Br-L	C	7	Own	Wo	—	6WH	D	189 1/2	8300	36x8	4 wh 36x8
Diamond T 1000	5	4420	Her YXC 2	6	4 1/2x4 3/4	48.6	Pb	Zen	Gra	Aut	Br-L	C	4	Tim	Wo	—	R	D	170 1/2	9700	S36x6	S40x12
Diamond T 1200	6	5600	Her YXC 2	6	4 1/2x4 3/4	48.6	Pb	Zen	Gra	Aut	Br-L	C	7	Tim	Wo	—	4RW	D	180	11000	34x7	4 w h 34x7D
Diamond T 1600	8	6220	Her YXC 3	6	4 5/8x4 3/4	51.3	Pb	Zen	Gra	Aut	Br-L	C	7	Tim	Wo	—	4W	D	190	11700	36x8	4 wh 36x8D
Diamond T 2500	10-12	8000	Wak 6 RB	6	5 x5 3/4	60	Pb	Zen	Gra	Mag	Br-L	C	7	Tim	Wo	—	4W	D	194	13100	S36x7	4 wh 36x12S
Dodge Bros. U-1	1/2	545	Own	4	3 5/8x4 1/4	21.3	Pb	Car	Vac	NE	Own	U	3	Own	Sp	14.28	4	D	109	1900	5.00x20B	5.00x20B
Dodge Bros. U-1	3/4	695	Own	4	3 5/8x4 1/4	21.3	Pb	Car	Vac	NE	Own	U	3	Own	Sp	21.68	4	D	124	2260	5.50x20B	5.50x20B
Dodge Bros. U-1	1	795	Own	4	3 5/8x4 1/4	21.3	Pb	Car	Vac	NE	Own	U	4	Own	Sp	36.136	4	D	133	2590	6.00x20B	32x6
Dodge Bros. DA1	3/4	795	Own	6	3 3/8x3 7/8	27.3	Pb	Zen	Vac	NE	Own	U	3	Own	Sp	19.21	4	D	124	2360	5.50x20B	5.50x20B
Dodge Bros. DA1	1	895	Own	6	3 3/8x3 7/8	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	33.45	4	D	133	2690	6.00x20B	32x6
Dodge Bros. DA1	1	1095	Own	6	3 3/8x3 7/8	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	36.83	4	D	140	2955	30x5	30x5
Dodge Bros. DA1	1 1/2	1365	Own	6	3 3/8x3 7/8	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	36.83	4	D	150	3695	32x6	32x6
Dodge Bros. DA1	1 1/2	1415	Own	6	3 3/8x3 7/8	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	36.83	4	D	165	3810	32x6	32x6
Dodge Bros. DB1	2	1595	Own	6	3 3/4x4 1/2	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	36.83	4	D	150	3930	32x6	34x7
Dodge Bros. DB1	2	1645	Own	6	3 3/4x4 1/2	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	36.83	4	D	165	4070	32x6	34x7
Dodge Bros. DB1	3	1845	Own	6	3 3/4x4 1/2	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	46.31	4	D	135	4235	32x6	32x6D
Dodge Bros. DBI	3	1895	Own	6	3 3/4x4 1/2	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	41.43	4	D	165	4520	32x6	32x6D
Dodge Bros. DB1	3	1945	Own	6	3 3/4x4 1/2	27.3	Pb	Zen	Vac	NE	Own	U	4	Own	Sp	46.31	4	D	185	4715	32x6	32x6D
Dover	3/4	445	Own	6	2 3/4x4 1/2	18.2	CS	Mar	Vac	Aut	Own	U	3	Own	Sp	17.8	4	4	110	2150	30x5	31x5.50
Durant Com. Chassis	1/2	495	Con	4	3 3/8x4 1/4	18.2	Pb	Til	Vac	Aut	Own	C	3	Own	Sp	16.16	4	4	107	1670	28x4.75	28x4.75
Fargo Packet	1/2	545	Own	6	3 x4 1/8	21.6	Pb	Str	Vac	NE	Own	U	3	Own	Sp	14.29	4	Tr	——	1835	5.00x19	5.00x19
Fargo Clipper	3/4	725	Own	6	3 1/8x4 1/4	23.4	Pb	Str	Vac	DR	Own	U	3	Own	Sp	15.53	4	Tr	——	2325	5.50x18	5.50x18
Fargo Freighter	1	795	Own	6	3 x4 1/8	21.6	Pb	Str	Vac	NE	Own	U	4	Own	Sp	37.19	4	Tr	——	2785	6.00x20	32x6
Federal 4FW	1	980	Wak X A	4	3 1/2x4 1/2	19.6	Pb	Zen	Vac	DR	W-G T9	U	4	Cla B370	Sp	40.8	4	Tr	127	2975	30x5	30x5
Federal E6	1	1090	Con 17 E	6	3 3/8x4	27.3	Pb	Zen	P	DR	W-G T9	U	4	Cla B370	Sp	34.6	4	Tr	132	3120	30x5	30x5
Federal D	1-1 1/2	830	———	4	3 7/8x4 1/4	24	Pb	—	P	—	———	—	-	———	—	—	—	—	131	3060	6.00x20	32x6
Federal F7	1 1/2	1525	Con 16 C	6	3 3/8x4 3/8	27.3	Pb	Zen	P	DR	Own	U	4	Tim 52005H	Sp	24.3	4	Tr	132	3765	30x5	30x5D
Federal A6	2	1855	Con 16 C	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	DR	Own	C	4	Cla B610	Sp	38.5	4	Tr	151	4580	32x6	32x6D
Federal A6T	2 1/2	2185	Con 16 C	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	DR	Own	C	4	Tim 58000H	Sp	41.3	4	Tr	151	4950	32x6	32x6D
Federal A 6 T W	2 1/2	2360	Con 16 C	6	3 3/8x4 3/8	27.3	Pb	Zen	Vac	DR	Own	C	4	Tim 65001 H	Wo	42.0	4	Tr	151	4950	32x6	32x6D
Federal T10B	2 1/2-3	2740	Con 16 R	6	4 x4 1/8	38.4	Pb	Zen	P	DR	Own	C	4	Tim 58000H	Sp	36.3	4	Tr	165	6600	34x7	34x7D
Federal T10W	2 1/2-3	2915	Con 16 R	6	4 x4 1/8	38.4	Pb	Zen	P	DR	Own	C	4	Tim 65001H	Wo	44.0	4	Tr	165	6600	34x7	34x7D
Federal U6	3-3 1/2	3860	Con 18 R	6	4 x4 1/2	38.4	Pb	Str	P	DR	Br-L 55	C	7	Tim 65706HP	Wo	64.6	4	D	165	7210	34x7	34x7D
Federal 4C6A	4-5	4735	Con 20 R	6	4 1/8x4 3/4	40.8	Pb	Zen	P	DR	Br-L 55	C	7	Tim 66704HP	Wo	73.6	4	D	192	8330	36x8	36x8D
Federal 4C6AB	4-5	4960	Con 20 R	6	4 1/8x4 3/4	40.8	Pb	Zen	P	DR	Br-L 55	C	7	Tim 66704TWP	Wo	73.6	4	D	192	8600	36x8	36x8D
Federal X8	7 1/2	5085	Con B 7	4	5 x6	40	Pw	Zen	Vac	AB	Br-L 60	C	7	Tim 68700DP	Wo	110.9	R	D	162	9750	36x6S	40x14S
Federal X8R	7 1/2	5810	Con 21 R	6	4 3/8x4 3/4	45.9	Pb	Zen	P	DR	Br-L 60	C	7	Tim 68700DP	Wo	110.9	R	D	162	10000	40x8	40x8D
Ford AA	1 1/2	520	Own	4	3 7/8x4 1/4	24.0	Sp	Zen	Gra	Own	Own	U	4	Own	St	42.24	4	R	131 1/2	2792	6.00x20	32x6
Ford AA	1 1/2	545	Own	4	3 7/8x4 1/4	24.0	Sp	Zen	Gra	Own	Own	U	4	Own	St	42.24	4	R	157	2570	6.00x30	6.00x30D
F. W. D.—H	1 1/2	3300	Wis S U	4	4 x5	25.6	Pb	Zen	Vac	Eis	Cotta	C	4	Own	St	38.1	4	R	121	5300	34x7	34x7
F. W. D.—H 6	2	3425	Wak	6	3 1/2x4 1/2	29.4	Pb	Zen	Vac	Eis	Br-L	U	4	Own	St	35.0	4	R	133	5500	34x7	34x7
F. W. D.—BTL 4	2	3900	Wis S U	4	4 x5	25.6	Pb	Zen	Vac	Eis	Br-L	C	7	Own	St	84.7	4	R	120	6000	36x8	36x8
F. W. D.—HH 6	2 1/2	4000	Wak	6	3 3/4x4 1/2	33.7	Pb	Zen	Vac	Eis	Br-L	C	7	Own	St	101.0	4	R	133	5700	36x8	36x8
F. W. D.—B	3	4200	Own	4	4 3/4x5 1/2	36.1	Pb	Str	Gra	Eis	Own	C	3	Own	St	35.6	4	R	124	6460	36x6S	36x6S
F. W. D.—B 5	3	4525	Own	4	4 3/4x5 1/2	36.1	Pb	Str	Gra	Eis	Own	C	5	Own	St	88.6	4	R	132	6800	36x6S	36x6S
F. W. D.—B T	3	4742	Own	4	4 3/4x5 1/2	36.1	Pb	Str	Vac	Eis	Own	C	5	Own	St	101.0	4	R	133 3/4	7700	40x7S	40x5SD
F. W. D.—U 4	3	4575	Own	4	4 3/4x5 1/2	36.1	Pb	Str	Vac	Eis	Own	C	5	Own	St	88.6	4	R	148	7000	36x6S	36x6S
F. W. D.—U 6	3 1/2	4575	Wak	6	4 x4 3/4	38.6	Pb	Zen	Vac	Eis	Own	C	5	Own	St	88.6	4	R	148	7200	36x6S	36x6S
*F. W. D.—X 6	6	6500	Wak	6	4 1/4x4 3/4	43.3	Pb	Zen	Vac	Eis	Own	C	5	Own	St	88.6	4	4	170	9500	36x8	36x8
Garford Series S 11	1	1600	Bud H S 6	6	3 3/8x4 1/2	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Col	Sp	25.5	4	D	142	3900	30x5	30x5
Garford Series S 11	1 1/2	1900	Bud H S 6	6	3 3/8x4 1/2	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Sp	29.2	4	D	162	4300	30x5	D30x5
Garford Series 40	1 1/2	2990	Bud D S 6	6	3 5/8x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Wo	34.8	4	D	168	4700	34x5	D34x5
Garford Series S 11	2	2030	Bud H S 6	6	3 3/8x4 1/2	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Sp	29.2	4	D	162	4500	32x6	D32x6
Garford Series 40	2	3240	Bud D S 6	6	3 5/8x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Wo	34.8	4	D	168	4900	36x6	D36x6
Garford Series 40	2 1/2	3240	Bud D S 6	6	3 5/8x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Wo	34.8	4	D	168	5100	36x6	D36x6
Garford Series 60	2 1/4	4580	Bud B U S	6	4 x5 1/4	38.4	PC	Zen	Vac	Aut	Br-L	U	5	Tim	Wo	63.0	4	D	175	7000	36x6	D36x6

1930 COMMERCIAL CARS BUILT IN THE UNITED STATES

Make and Model	Capacity—Tons	Chassis Price	Engine	No. of Cyl.	Bore and Stroke	Tax H. P.	Oil System	Carburetor	Fuel Feed	Ignit. System	Gear Set	Location	No. Spds. For.	Rear Axle	Final Drive	Reduction in Low	Brakes, Foot	Brakes, Hand	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Rear
Garford Series 60	3	4680	Bud B U S	6	4 x5 1/8	38.4	PC	Zen	Vac	Aut	Br-L	U	5	Tim	Wo	63.0	4	D	175	7100	36x6	D36x7
Garford Series 80	3½	5250	Bud B A 6	6	4 1/8 x5 1/8	40.8	PC	Zen	Vac	Aut	Br-L	C	7	Tim	Wo	98.2	4	D	175	8200	S36x6	S36x12
Garford Series 80	4	5330	Bud B A 6	6	4 1/8 x5 1/8	40.8	PC	Zen	Vac	Aut	Br-L	C	7	Tim	Wo	98.2	4	D	175	8400	S36x6	S36x14
Gen. Mot. T11-1001	*3800	625	Pontiac	6	3 5/16 x3 7/8	26.3	Pb	Mar	P	DR	Own	U	3	Pontiac	Sp	14.7	4	4	109 5/8	1980	5.00x19B	5.50x19B
Gen. Mot. T15-1501	*5400	695	Pontiac	6	3 1/16 x3 7/8	26.3	Pb	Mar	P	DR	Own	U	3	Tim 51500	Sp	16.09	4	4	130	2625	5.50x20B	5.50x20B
Gen. Mot. T17-1701	*5500	735	Pontiac	6	3 5/16 x3 7/8	26.3	Pb	Mar	P	DR	Own	U	3	Tim 51505	Sp	16.04	4	4	130	2650	6.50x20B	6.50x20B
Gen. Mot. T17-1707	*6500	750	Pontiac	6	3 5/16 x3 7/8	26.3	Pb	Mar	P	DR	Own	U	3	Tim 51505	Sp	16.04	4	4	130	2670	5.50x20B	32x6
Gen. Mot. T19-2201	*6300	895	Pontiac	6	3 1/16 x3 7/8	26.3	Pb	Mar	P	DR	Mun	U	4	Tim 5261	Sp	34.45	4	D	130	2850	5.50x20B	32x6
Gen. Mot. T19-2214	*8500	985	Pontiac	6	3 5/16 x3 7/8	26.3	Pb	Mar	P	DR	Mun	U	4	Tim 5261	Sp	34.45	4	D	130	2925	30x5	30x5D
Gen. Mot. T25-2501	*6800	1235	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Tim 5261	Sp	29.62	4	D	130	3375	6.00x20B	7.50x20B
Gen. Mot. T25-2509	*8500	1280	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Tim 5261	Sp	29.62	4	D	130	3425	30x5	30x5D
Gen. Mot. T30-3206	*9000	1555	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Eat 1617	Sp	28.6	4	D	141	4450	6.00x20B	8.25x20B
Gen. Mot. T30-3203	*11000	1605	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Eat 1617	Sp	28.6	4	D	141	4525	32x6	32x6D
Gen. Mot. T42-4206	*10600	1735	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Eat 1717	Sp	33.38	4	D	141	4575	7.00x20B	9.00x20B
Gen. Mot. T42-4203	*14000	1960	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Eat 1717	Sp	33.38	4	D	141	4905	36x6	36x6D
Gen. Mot. T44-4401	*12000	1965	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Eat T44DR	2R	40.89	4	D	141	4825	32x6	32x6D
Gen. Mot. T44-4404	*15000	2095	Buick	6	3 7/16 x4 5/8	28.3	Pb	Mar	P	DR	Mun	U	4	Eat T44DR	2R	40.89	4	D	141	5095	34x7	34x7D
Gen. Mot. T60-6202	*16500	3035	Buick	6	3¾x5	33.7	Pb	Mar	P	DR	Mun	U	4	Tim 65706	Wo	52.53	4	D	154 1/4	6925	34x7	34x7D
Gen. Mot. T60-6205	*18500	3125	Buick	6	3¾x5	33.7	Pb	Mar	P	DR	Mun	U	4	Tim 65706	Wo	52.53	4	D	154 1/4	6925	9.00x20B	9.00x20DB
Gen. Mot. T82-8202	*19000	3795	Buick	6	3¾x5	33.7	Pb	Mar	P	DR	Br-L	C	5	Tim 66704	Wo	84.91	4	D	155	7500	9.00x20B	9.00x20DB
Gen. Mot. T82-8207	*22000	4070	Buick	6	3¾x5	33.7	Pb	Mar	P	DR	Br-L	C	5	Tim 66704	Wo	84.91	4	D	155	7850	38x7	38x9D
Gen. Mot. T90-9001	*23000	5885	Buick	6	3¾x5	33.7	Pb	Mar	P	DR	Br-L	C	5	Tim SW-200	Wo	75.04	WR	D	185 1/4	9400	7.50x20B	7.50x20D
Gen. Mot. T90-9004	*28000	6055	Buick	6	3¾x5	33.7	Pb	Mar	P	DR	Br-L	C	5	Tim SW-200	Wo	75.04	WR	D	185 1/4	9775	8.25x20B	8.25x20DB
*Gramm B	1½	1495	Lyc 4 SL	6	3¼x4½	25.3	Pb	Zen	Vac	Aut	Cov	U	4	Tim	Sp	34.3	4	Tr	140	3800	30x5	30x5D
*Gramm C	2	1795	Lyc ASA	6	3 5/8 x4½	31.54	Pb	Zen	P	Aut	Cov	U	4	Tim	Sp	31	4	Tr	160	4820	32x6	32x6D
*Gramm D	2½	2195	Lyc TS	6	3 7/8 x5	36	Pb	Zen	P	Aut	Cov	U	4	Tim	Sp	33	4	Tr	160	5100	32x6	32x6D
*Gramm E	3	2595	Lyc TS	6	3 7/8 x5	36	Pb	Zen	P	Aut	Ful	U	4	Wis	2R	35	4	R	150	5200	34x7	34x7D
*Gramm EY	3	3595	Con 20 R	6	4 1/8 x4¾	40.80	Pb	Zen	P	Aut	Ful	U	4	Tim	Sp	30	4	D	190	6750	32x6	32x6D
*Gramm GY	4	4345	Con 21 R	6	4 3/8 x4¾	45.9	Pb	Zen	P	Aut	Ful	U	4	Wis	2R	28	4	D	210	7200	34x7	34x7D
*Gramm HY	5	6545	Con 16 H	6	4¾x5¾	54.15	Pb	Zen	P	Aut	Ful	U	4	Wis	2R	25.2	4	D	236	9600	36x8	36x8D
*Gramm O-35	3	3595	Lyc TS	6	3 7/8 x5	36	Pb	Zen	P	Aut	Ful	C	8	Wis	2R	71.2	D	R	153	7200	36x5S	36x10S
*Gramm O-45	4	3995	Lyc TS	6	3 7/8 x5	36	Pb	Zen	P	Aut	Ful	C	8	Wis	2R	75.8	D	R	153	7700	36x5S	36x12S
*Gramm O-60	5	4745	Lyc TS	6	3 7/8 x5	36	Pb	Zen	P	Aut	Ful	C	8	Wis	2R	78.4	D	R	153	8800	36x6S	36x14S
*Gramm T-38	3	3595	Lyc TS	6	3 7/8 x5	36	Pb	Zen	P	Aut	Ful	U	4	Wis	2R	45	D	R	153	7200	36x5S	36x10S
*Gramm T-48	4	3995	Lyc TS	6	3 7/8 x5	36	Pb	Zen	P	Aut	Ful	U	4	Wis	2R	47	D	R	153	7700	36x5S	36x12S
Indiana 64	1	1195	Con 27 B	6	3 3/8 x4 5/8	27.3	Pb	Str	Vac	Aut	Br-L	20 U	3	Col 36020	Sp	21.3	4	Tr	137	3435	30x5	30x5
Indiana 74	1¼	1290	Con 27 B	6	3 3/8 x4 5/8	27.3	Pb	Str	Vac	Aut	Br-L	20 U	4	Col 36020	Sp	25.6	4	Tr	137	3450	32x6	32x6
Indiana 89	1½	1525	Con 27 B	6	3 3/8 x4 5/8	27.3	Pb	Str	Vac	Aut	Br-L	20 U	4	Col 55002	Sp	25.6	4	Tr	149	3650	32x6	32x6
Indiana 11	1¼	1425	Her OX	4	4 x5	25.6	Pb	Str	Gra	Aut	Br-L	31 U	3	Cla B 365	Sp	24.48	R	R	129 1/2	3500	30x5	30x5
Indiana 111	1½	1630	Her OX	4	4 x5	25.6	Pb	Str	Gra	Aut	Br-L	31 U	3	Cla B 509	Sp	26.4	R	R	129 1/2	3600	30x5	32x6
Indiana 111 XW	2	1850	Her OXP	4	4 x5	25.6	Pb	Str	Vac	Eis	Br-L	35 U	4	Wis 4611	2R	30.14	R	Tr	120	3740	32x6	32x6D
Indiana 120	2	1990	Con 30 B	6	4 x4 1/8	38.4	Pb	Str	P	Aut	Br-L	35 U	4	Tim 54003 H	Sp	—	4	Tr	156	5200	32x6	32x6D
Indiana 140	2	2495	Con 30 B	6	4 x4 1/8	38.4	Pb	Str	P	Aut	Br-L	35 U	4	Wis 4916 L	2R	—	4V	Tr	156	5500	32x6	32x6D
Indiana 115 A	2½	2740	Her OXCP	4	4 1/4 x5	28.9	Pb	Str	Vac	Eis	Br-L	35 U	4	Cla B 720	Sp	42.99	R	Tr	132	4970	32x6	34x7D
Indiana 615 A	2½	3070	Wis Y	6	3 3/8 x5	27.34	Pb	Str	Vac	Eis	Br-L	35 U	4	Cla B 720	Sp	46.29	R	Tr	136	5160	32x6	34x7D
Indiana 126	3	3780	Wis L	4	4 1/2 x3 3/4	32.4	Pb	Str	Vac	Eis	Br-L	55-7 C	7	Tim 65704 S P	Wo	80.7	R	J	162 1/2	7400	36x5S	36x10S
Indiana 626	3	4185	Wis H	6	4 x5	38.40	Pb	Str	Vac	Eis	Br-L	55-7 C	7	Tim 65704 S P	Wo	73.6	R	J	168 1/2	7625	36x5S	36x10S
Indiana 627	3	3725	Wis H	6	4 x5	38.40	Pb	Str	Vac	Aut	Br-L	55-4 U	4	Cla B 720	Sp	42.8	R	D	168 3/4	6500	32x6	38x9
Indiana 127 AW	3	3775	Her K	4	4 1/4 x5	28.90	Pb	Str	Vac	Eis	Br-L	51-5 U	5	Wis 1228	2R	41.72	RV	D	158 1/4	7000	34x7	34x7D
Indiana 627 AW	3	4075	Wis H	6	4 x5	38.40	Pb	Str	Vac	Eis	Br-L	51-5 U	5	Wis 1228	2R	41.72	RV	D	156 1/4	7200	34x7	34x7D
Indiana 638	4	4955	Wis H	6	4 x5	38.40	Pb	Str	Vac	Eis	Br-L	60-7 C	7	Tim 66700 S P	Wo	83.1	R	J	174 1/4	8100	36x5S	36x12S
Indiana 290	7	7250	Con 36 B	6	4¾x5 3/4	54.15	Pb	Str	P	L-N	Br-L	70-7 C	7	Tim 68703 E	Wo	—	4W	D	182	10750	38x7	40x14S
Indiana 640	10	9700	Con 36 B	6	4¾x5 3/4	54.15	Pb	Str	P	L-N	Br-L	70-7 C	7	Tim 6 Wh	Wo	—	4RW	D	212	14000	38x7	36x10S
International AW-1	¾	720	Wak X A	4	3 1/2 x4 1/2	19.6	Pb	Zen	Vac	DR	MM	V	3	Eat 517	Sp	17.4	4	2	136	2620	5.25x20	5.25x20
Int. Harvester Sp. Del.	¾	720	Wak X A	4	3 1/2 x4 1/2	19.6	Pb	Zen	Vac	DR	Mec	U	3	Eat 502 R	Sp	15.1	4	2	124	2200	30x5.25	30x5.25
Int. Harv. 6 Spd. Spec.	1	820	Wak X A	4	3 1/2 x4 1/2	19.6	Pb	Zen	Vac	DR	Mec	U	3	Eat 1124	Sp	*52.6	4	2	124	2430	30x5	30x5
Int. Harvester S-24	1¼	1160	Lyc C T	4	3¾x5	22.5	Pw	Zen	Vac	DR	Own	U	3	Eat 1002	Sp	21.3	4	2	130	3200	30x5	30x5
Int. Harvester S-26	1¼	1310	Lyc 4 S L	6	3¼x4 1/2	25.3	Pb	Zen	Vac	DR	Own	U	3	Eat 1002	Sp	21.3	4	2	130	3250	30x5	30x5
Int. Harvester SF-34	1½	1450	Lyc C T	4	3¾x5	22.5	Pw	Zen	Vac	DR	Own	U	3	Eat 1502	Sp	22.6	4	2	*140	3520	30x5	32x6
International AL-3	1½	1450	Lyc SLH	6	3¼x4 1/2	25.3	Pb	Zen	Vac	DR	W-G	V	4	Eat 1518	Sp	42.9	4	2	138	4300	6.00x20	6.00x20D
Int. Harvester SF-36	1½	1600	Lyc 4 S L	6	3¼x4 1/2	25.3	Pb	Zen	Vac	DR	Own	U	3	Eat 1502	Sp	22.6	4	2	*140	3570	30x5	32x6
Int. Harvester SD-44	2	1590	Lyc C T	4	3¾x5	22.5	Pw	Zen	Vac	AB	Own	U	4	Eat 2002	Sp	40.6	4	2	117	3700	30x5	32x6
Int. Harvester SD-46	2	1740	Lyc 4 S L	6	3¼x4 1/2	25.3	Pb	Zen	Vac	AB	Own	U	4	Eat 2002	Sp	40.6	4	2	117	3750	30x5	32x6
Int. Harvester SF-46	2	1950	Lyc 4 S L	6	3¼x4 1/2	25.3	Pb	Zen	Vac	DR	Own	U	4	Eat 2002	Sp	40.6	4	2	*140	4000	32x6	32x6D
Int. Harvester A-4	2	1985	Own-FBB	6	3 5/8 x4 1/2	31.5	Pb	Zen	Vac	DR	Own	U	5	Eat 1712	Sp	47.8	4	2	*145	5070	32x6	32x6D
Int. Harvester A-5	3	2550	Own-FBB	6	3 5/8 x4 1/2	31.5	Pb	Zen	Vac	DR	Own	U	5	Eat 2112	Sp	52.6	4	2	*156	5606	34x7	34x7D
Int. Harvester HS-54	2½	3850	Hall-S 151	4	4¼x5 1/2	28.9	Pb	Zen	Vac	RB	Own	U	5	Eat 54	2R	60.5	4	4	*148	8000	36x5S	36x8S
Int. Harvester HS-54-C	2½	3850	Hall-S 151	4	4¼x5 1/2	28.9	Pb	Zen	Vac	RB	Own	U	5	Own A M 428	Ch	63.8	4	4	*148	8665	36x5S	36x10S
Int. Harvester W-1	2½	3850	Hall-S 151	4	4¼x5 1/2	28.9	Pb	Zen	Vac	RB	Own	U	5	Eat 58	2R	60.5	4	2	*148	8300	36x5S	36x8S
Int. Harvester HS-74	3½	4850	Hall-S 152	4	4¾x5 1/2	36.1	Pb	Zen	Vac	RB	Own	U	5	Eat 74	2R	70.5	4	4	*160	10700	36x5S	40x12S
Int. Harvester HS-74-C	3½	4850	Hall-S 152	4	4¾x5 1/2	36.1	Pb	Zen	Vac	RB	Own	U	5	Own A M 427	Ch	79.1	4	4	*160	11000	36x6S	40x12S
Int. Harvester W-3	3½	4850	Hall-S 152	4	4¾x5 1/2	36.1	Pb	Zen	Vac	RB	Own	U	5	Eat 78	2R	70.5	4	2	*160	10125	36x6S	40x12S
Int. Harv's'r HS-104-C	5	5500	Hall-S 152	4	4¾x5 1/2	36.1	Pb	Zen	Vac	RB	Own	U	5	Own A M 427	Ch	90.5	4	4	*160	11095	36x6S	40x14S
La France-Repub. A-1	*6000	990	Lyc	6	2 7/8 x4¾	19.8	Pb	Zen	Vac	Aut	Ful	U	4	Tim	Sp	36.1	4	Tr	132	3000	5.50x20	32x6
La France-Repub. C-1	*7000	1295	Lyc	6	3¼x4½	25.4	Pb	Zen	Vac	Aut	Br-L	U	4	Tim	Sp	29.1	4	Tr	144	3300	6.00x20	32x6
La France-Repub. D-1	*9000	1595	Lyc	6	3¼x4½	25.4	Pb	Zen	Vac	Aut	Ful	U	4	Tim	Sp	37.9	4	Tr	144	3725	30x5	30x5D
La France-Repub. F-2	*13000	2395	Lyc	6	3⅝x5	31.5	Pb	Zen	Vac	Aut	Ful	U	4	Tim	Sp	40.1	4	D	174	5870	32x6	32x6D
La France-Repub. H-1	*15000	2985	Lyc	6	3 7/8 x5	36.0	Pb	Zen	Vac	Aut	Ful	U	4	Eat	Sp	36.0	4	D	163	5850	34x7	34x7D
La France-Repub. L-1	*18000	3595	Lyc	6	3 7/8 x5	36.0	Pb	Zen	Vac	Aut	Ful	U	4	Eat	2R	48.0	4	D	180	6900	36x8	36x8D
La France-Repub. M-1	*20000	3800	Wak	6	4 x4¾	38.4	Pb	Zen	Vac	Aut	Ful	U	5	Eat	2R	62.3	R	D	171	6900	36x8	36x8D
Mack AB	2½-3	3950	Own	4	4¼x5	28.9	Pb	Str	Gra	RB	Own	U	4	Own	2R	Opt	R	D	2-Opt	——	36x4S	36x8S
††Mack BJ	3½-5	6150	Own	6	4½x5½	48.6	Pb	Str	Vac	NE	Own	C	4	Own	2R	Opt	4	D	3-Opt	——	36x8	36x8D
††Mack AK	3½-5	5150	Own	4	5 x6	40.0	Pb	Str	Gra	RB	Own	J	4	Own	Ch	Opt	4	J	3-Opt	——	36x5S	36x5DS
††Mack AK	3½-5	5250	Own	4	5 x6	40.0	Pb	Str	Gra	RB	Own	C	4	Own	2R	Opt	4	D	3-Opt	——	36x5S	36x5DS
††Mack AC	3½-5	4950	Own	4	5 x6	40.0	Pb	Str	Gra	RB	Own	J	4	Own	Ch	Opt	J	R	3-Opt	——	36x5S	40x10S
††Mack AC	5½-7	5500	Own	4	5 x6	40.0	Pb	Str	Gra	RB	Own	J	4	Own	Ch	Opt	J	R	3-Opt	——	36x6S	40x12S
††Mack AC	7½	6000	Own	4	5 x6	40.0	Pb	Str	Gra	RB	Own	J	4	Own	Ch	Opt	J	R	3-Opt	——	36x7S	40x14S
††Mack AP	7½	9500	Own	6	5 x6	60.0	Pb	Str	Gra	NE	Own	J	4	Own	Ch	Opt	R	J	191	——	36x7S	40x8DS
Mack BL	1	2500	Own	6	3 1/4 x5	25.39	Pw	Str	Vac	NE	Own	U	4	Own	Sp	Opt	4	D	148	——	B6.00x20	DB6.00x20
††Mack BG	1½	3000	Own	6	3 5/8 x5	31.57	Pw	Str	Vac	NE	Own	U	4	Own	Sp	Opt	4	D	138-156	——	32x6	D32x6
††Mack AB	2½-3	3500	Own	4	4¼x5	28.9	Pb	Str	Gra	RB	Own	U	4	Own	Ch	Opt	R	D	2-Opt	——	36x4S	36x8S
Mack AB	2½-3	4750	Own	6	3 5/8 x5	31.57	Pw	Str	Vac	NE	Own	U	4	Own	2R	Opt	R	D	2-Opt	——	34x7	D34x7
††Mack AB	2½-3	4300	Own	6	3 5/8 x5	31.57	Pw	Str	Vac	NE	Own	U	4	Own	Ch	Opt	R	D	2-Opt	——	34x7	D34x7
††Mack BC	3½-4	5250	Own	6	4 x5 1/2	38.4	Pb	Str	Vac	NE	Own	U	4	Own	2R	Opt	4	D	2-Opt	——	34x7	D36x8
††Mack BC	3½-4	4250	Own	4	4¼x5	28.9	Pb	Str	Gra	RB	Own	U	4	Own	2R	Opt	4	D	2-Opt	——	36x5S	36x5DS
Mack AC 6-wheel	10	7500	Own	4	5 x6	40.0	Pb	Str	Gra	RB	Own	J	4	Own	Ch	Opt	4R	J	3-Opt	——	36x7S	40x12S
Mack AP 6-wheel	10	12000	Own	6	5 x6	60.0	Pb	Str	Gra	NE	Own	J	4	Own	Ch	Opt	4R	J	3-Opt	——	36x7	40x12S
Paige	¾	860	Own	6	3¼x4½	25.35	Pb	DL	P	DR	W-G	U	3	Sal	Sp	17.36	4	Tr	115	2465	B5.50x19	B5.50x19
Relay Series S 11	1	1700	Bud H S 6	6	3 3/8 x4 1/2	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Own		25.7	4	D	142	4050	30x5	30x5
Relay Series S 11	1½	1900	Bud H S 6	6	3 3/8 x4 1/2	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Own		25.7	4	D	162	4500	30x5	D30x5
Relay Series 40	1½	2990	Bud D S 6	6	3 5/8 x5	31.2	PC	Zen	Vac	Aut	Br-L	U	4	Own		34.5	4	D	168	5300	34x5	D34x5
Relay Series S 11	2	2030	Bud H S 6	6	3 3/8 x4 1/2	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Own		30.0	4	D	162	4700	32x6	D32x6
Relay Series 40	2	3240	Bud D S 6	6	3 5/8 x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Own		34.5	4	D	168	5500	36x6	D36x6
Relay Series 50	2	3860	Bud D W 6	6	3¾x5	33.7	PC	Zen	Vac	Aut	Br-L	U	5	Own		58.5	4	D	161	6800	36x6	D36x6
Relay Series 40	2½	3240	Bud D S 6	6	3 5/8 x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Own		34.5	4	D	168	5700	36x6	D36x6
Relay Series 50	2½	3950	Bud D W 6	6	3¾x5	33.7	PC	Lon	Vac	Aut	Br-L	U	5	Own		58.5	4	D	161	7000	36x6	D38x7
Relay Series 60	2½	4530	Bud B U S	6	4 x5 1/8	38.4	PC	Lon	Vac	Aut	Br-L	U	5	Own		58.5	4	D	175	7350	36x6	D36x6
Relay Series 50	3	4130	Bud D W 6	6	3⅝x5	33.7	PC	Lon	Vac	Aut	Br-L	U	5	Own		58.5	4	D	161	7200	36x6	D40x8
Relay Series 60	3	4595	Bud B U S	6	4 x5 1/8	38.4	PC	Lon	Vac	Aut	Br-L	U	5	Own		58.5	4	D	175	7500	36x6	D38x7
Relay Series 80	3	5250	Bud B A 6	6	4 1/8 x5 1/8	40.8	PC	Lon	Vac	Aut	Br-L	U	8	Own		84.18	4	D	175	8400	36x6	S40x10
Relay Series 60	3½	4745	Bud B U S	6	4 x5 1/8	38.4	PC	Lon	Vac	Aut	Br-L	U	5	Own		58.5	4	D	175	7800	38x7	D40x8
Relay Series 80	3½	5330	Bud B A	6	4 1/8 x5 1/8	40.8	PC	Lon	Vac	Aut	Cov	C	8	Own		84.18	4	D	175	8600	36x6	S40x12
Relay Series 80	4	5380	Bud B A	6	4 1/8 x5 1/8	40.8	PC	Lon	Vac	Aut	Cov	C	8	Own		84.18	4	D	175	8800	38x7	S40x14

Major Specifications and Mechanical Details of 1930 Commercial Cars Built in the United States

Make and Model	Capacity—Tons	Chassis Price	Engine	No. of Cyl.	Bore and Stroke	Tax H. P.	Oil System	Carburetor	Fuel Feed	Ignit. System	Gear Set	Location	No. Spds. For.	Rear Axle	Final Drive	Reduction in Low	Brakes, Foot	Brakes, Hand	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Rear
Reo 15 Junior	½	785	Con 16 E	6	3⅜x4	27.3	Pb	Sch	P	DR	W-G	U	3	Sal	Sp	14.63	4	Tr	115	2290	6.00x18	6.00x18
Reo D A	1	995	Con 16 E	6	3⅜x4	27.3	Pb	Sch	Vac	DR	W-G	U	3	Own	Sp	18.4	4	Tr	123	2755	30x5	30x5
Reo D F	1	1095	Own C B	6	3⅜x5	27.3	Pb	Sch	P	DR	Own	U	3	Own	Sp	17.1	4	Tr	135	3200	6.00x20	32x6
Reo F A	1½	1295	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	22.96	4	Tr	137	3525	32x6	32x6
Reo F E	1½	1395	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	22.96	4	Tr	152	3700	32x6	32x6
Reo F H	2	1595	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	37.6	4	Tr	142	4165	32x6	32x6D
Reo F C	2	1645	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	37.62	4	Tr	152	4025	32x6	32x6D
Reo F D	2	1745	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	37.62	4	Tr	168	4075	32x6	32x6D
Reo G A	3	2035	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	41.05	4	Tr	163	4625	32x6	32x6D
Reo G C	3	2140	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	41.05	4	Tr	179	4850	32x6	32x6D
Reo G D	3	1985	Own	6	3⅜x5	27.3	Pb	Sch	Vac	DR	Own	U	4	Own	Sp	46.2	4	Tr	144	4570	32x6	32x6D
Rugby ½ T	½	655	Con	6	3¼x4	25.4	Pb	Str	AC	Aut	Own	U	3	Own	Sp	15.6	4	4	—	2160	29x5	29x5
Rugby 6-15	1	865	Con	6	3¼x4	25.4	Pb	Str	AC	Aut	Br-L	U	4	Sal	Sp	34.49	4	Tr	135	2900	20x5.50	32x6
Selden 7 C	1	1098	Con	6	2⅜x4¾	19.84	Pb	Zen	Vac	Aut	BB	U	3	Tim	Sp	—	4	D	124	3600	30x5	30x5
Selden 17 C	1½	1500	Con	6	3⅜x4	27.3	Pb	Zen	Vac	Aut	Br-L	U	4	Tim	Sp	—	4	D	142	3900	32x6	32x6
Selden 317 C	1½	3900	Con	6	3⅜x4⅝	27.34	Pb	Str	Vac	Aut	Br-L	U	4	Tim	Sp	—	4	D	142	3900	32x6	32x6
Selden 37 C	2	1935	Con	6	3⅜x4⅝	27.34	Pb	Str	Vac	Aut	Br-L	U	4	Tim	Sp	—	4	D	151	4800	32x6	32x6D
Selden 39 C	2½	2920	Con	6	4 x4⅛	38.4	Pb	Str	Vac	Aut	Br-L	U	4	Tim	Sp	—	4	D	164	5800	32x6	32x6D
Selden 47 C B	3½	3785	Con	6	4 x4½	38.4	Pb	Str	Vac	Aut	Br-L	U	4	Tim	Sp	—	4	D	171	7200	34x7	34x7D
Selden 47 C D	4	4435	Con	6	4 x4½	38.4	Pb	Str	Vac	Aut	Br-L	U	5	Wis	2R	—	4	D	171	7600	36x8	36x8D
Selden 67 C	5	4975	Con	6	4⅜x4¾	45.94	Pb	Str	Vac	Aut	Br-L	U	7	Wis	2R	—	4	D	171	8700	36x8	36x8D
Selden 77	7	7365	Con	6	4¾x5¾	54.15	Pb	Str	Vac	Aut	Br-L	U	7	Wis	2R	—	4	D	178	12000	36x7	40x7D
Service Series S 11	1	1600	Bud H S 6	6	3⅜x4½	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Col	Sp	25.5	4	D	142	3900	30x5	30x5
Service Series S 11	1½	1900	Bud H S 6	6	3⅜x4½	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Sp	29.2	4	D	162	4300	30x5	D30x5
Service Series 40	1½	2990	Bud D S 6	6	3⅝x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Wo	34.8	4	D	168	4700	34x5	D34x5
Service Series S 11	2	2030	Bud H S 6	6	3⅜x4½	27.3	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Sp	29.2	4	D	162	4500	32x6	D32x6
Service Series 40	2	3240	Bud D S 6	6	3⅝x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Wo	34.8	4	D	168	4900	36x6	D36x6
Service Series 40	2½	3240	Bud D S 6	6	3⅝x5	31.5	PC	Zen	Vac	Aut	Br-L	U	4	Tim	Wo	34.8	4	D	168	5100	36x6	D36x6
Service Series 60	2½	4580	Bud B U S	6	4 x5⅛	38.4	PC	Zen	Vac	Aut	Br-L	U	5	Tim	Wo	63.0	4	D	175	7000	36x6	36x6
Service Series 60	3	4680	Bud B U S	6	4 x5⅛	38.4	PC	Zen	Vac	Aut	Br-L	U	5	Tim	Wo	63.0	4	D	175	7100	36x6	D38x7
Service Series 80	3½	5250	Bud B A 6	6	4⅛x5⅛	40.8	PC	Zen	Vac	Aut	Br-L	C	7	Tim	Wo	98.2	4	D	175	8200	S36x6	S36x12
Service Series 80	4	5330	Bud B A 6	6	4⅛x5⅛	40.8	PC	Zen	Vac	Aut	Br-L	C	7	Tim	Wo	98.2	4	D	175	8400	S36x6	S36x14
Service Series 100	5	5830	Bud B A 6	6	4⅛x5⅛	40.8	PC	Zen	Vac	Aut	Br-L	C	7	Tim	Wo	98.2	4	D	175	9600	S36x6	S40x14
Stewart 30	1	695	Lyc AFE	4	3¾x4½	22.5	Pb	Str	Vac	DR	W-G	U	4	Sal	Sp	—	4	D	130	2905	6.50x20	6.50x20
Stewart 30 X	1	795	Lyc WRG	6	2⅞x4½	19.8	Pb	Str	Vac	DR	W-G	U	4	Sal	Sp	—	4	D	130	2965	6.50x20	6.50x20
*Stewart 16 A	1¼	1195	Lyc CT	4	3¾ x5	22.5	Pb	Str	Vac	DR	W-G	U	4	Cla	Sp	24.0	4	D	130	3526	32x6	32x6
*Stewart 16 XA	1¼	1195	Lyc 4 SL	6	3¼x4½	25.3	Pb	Str	Vac	DR	W-G	U	4	Cla	Sp	24.0	4	D	130	3526	32x6	32x6
Stewart 28 X	1½	1495	Lyc 4 SL	6	3¼x4½	25.3	Pb	Str	Vac	DR	Ful	U	4	Cla	Sp	27.3	4	D	136	3840	30x5	30x5D
Stewart 29 X	2	1695	Lyc 4 SL	6	3¼x4½	25.3	Pb	Str	Vac	DR	Ful	U	4	Cla	Sp	27.3	4	D	145	4188	32x6	32x6D
Stewart 26 X W	2	2290	Lyc TF	6	3⅝x5	31.5	Pw	Str	Vac	DR	Ful	U	4	Tim	Wo	29.0	4	D	165	5095	32x6	32x6D
*Stewart 18 X	2½	2690	Lyc TF	6	3⅝x5	31.5	Pw	Str	Vac	DR	Ful	U	4	Tim	Wo	29.0	4	D	165	5788	32x6	32x6D
Stewart 32 X	2½	1990	Lyc ASA	6	3⅝x4¾	31.54	Pw	Str	Vac	DR	Ful	U	4	Cla	Sp	7.25:1	4	D	165	5100	32x6	32x6D
Stewart 33 X	3	3290	Lyc TS	6	3¾x5	36.2	Pw	Str	Vac	DR	Ful	U	4	Tim	Wo	7.25:1	4	D	165	6450	34x7	34x7D
Stewart 19 X	3½	3690	Lyc TS	6	3¾x5	36.2	Pw	Str	Vac	DR	Ful	C	12	Tim	Wo	105.1	4	D	165	6990	36x5	36x10
Stewart 31 X	5	4990	Wak 6 RSL	6	4¾x5⅛	45.9	Pw	Str	Vac	DR	Ful	C	8	Tim	Wo	10.5:1	4	D	165	8400	36x6S	36x6SD
Stewart 27 X	6-7	5700	Wak 6 RSL	6	4⅜x5⅛	45.99	Pw	Str	Vac	DR	Ful	U	8	Tim	Wo	93.81	4	D	165	9927	36x7	40x7D
Studebaker GN-P	¾	845	Own	6	3⅛x4¼	27.3	Pb	Str	P	DR	Own	U	3	Own	Sp	15.15	4	4	115	2465	6.00x19	6.00x19
Studebaker GN-S	1	1045	Own	6	3⅜x4⅛	27.3	Pb	Str	P	DR	Own	U	3	Own	Sp	13.8	4	D	130	2990	6.00x20	30x5
Studebaker GK-N	1	1095	Own	6	3⅛x4⅝	27.3	Pb	Str	P	DR	Own	U	3	Own	Sp	13.8	4	D	146	3000	30x5	30x5
Studebaker GN-N	*4000	1245	Own	6	3⅛x4⅛	27.3	Pb	Str	P	DR	Cla	U	4	Cla	Sp	33.5	4	D	146	3265	30x5	32x6
Studebaker 77	*12500	2895	Own	8	3½x4⅜	39.2	Pb	Str	P	DR	Ful	U	4	Eat	Sp	24.6	4V	D	158	5030	7.00x20	7.00x20D
Studebaker 88	*12500	3295	Own	8	3½x4⅜	39.2	Pb	Str	P	DR	Ful	U	4	Eat	Sp	24.6	4V	D	184	5200	7.50x20	7.50x20D
Studebaker 99	*14000	3795	Own	8	3½x4⅜	39.2	Pb	Str	P	DR	Ful	U	4	Eat	Sp	24.6	4V	D	184	5680	7.50x20	7.50x20D
Whippet 96 A	½	360	Own 96 A	4	3⅛x4¾	15.6	Pb	Til	Vac	Aut	Own	U	3	Own	Sp	14.74	4	R	103¼	1691	4.75x19	4.75x19
†White 15 B	1	1545	Own GKA	4	3¾x5⅛	22.5	CS	Zen	Vac	L-N	Own	C	4	Own	Sp	18.6	R	R	133½	3242	30x5	30x5
†White 57	1¼	2725	Own GRC	4	4 x5¾	25.6	Pw	Zen	Vac	L-N	Own	U	4	Own	Sp	19.3	R	R	146	3755	32x6	32x6
†White 20 A	1½	2125	Own GKA	4	3¾x5⅛	22.5	CS	Zen	Vac	L-N	Own	C	4	Own	2R	32.1	R	R	145½	4412	34x5	34x5D
†White 56	2	3125	Own GRC	4	4 x5¾	25.6	Pw	Zen	Vac	Mag	Own	U	4	Own	Sp	26.2	R	D	165	5096	36x4S	36x7S
†White 51 A	2½	3750	Own GRB	4	4¼x5¾	28.9	Pw	Zen	Vac	Mag	Own	U	4	Own	Sp	35.5	R	D	170	6256	36x5S	36x8S
†White 55	3½	4650	Own GRB	4	4¼x5¾	28.9	Pw	Zen	Vac	Mag	Own	U	4	Own	IG	66.1	D	R	174	8512	36x5S	40x5SD
†White 52 T	3½	4700	Own GRB	4	4¼x5¾	28.9	Pw	Zen	Vac	Mag	Own	U	4	Own	IG	76.5	D	R	129½	8236	36x5S	40x5SD
†White 52	5	5100	Own GRB	4	4¼x5¾	28.9	Pw	Zen	Vac	Mag	Own	U	5	Own	IG	92.3	D	R	174	9184	36x6S	40x12S
†*White 58	3	4400	Own GRB	4	4¼x5¾	28.9	Pw	Zen	Vac	Mag	Own	U	4	Own	IG	49.7	4	R	180	7535	36x5S	36x5SD
†White 60	1	1850	Own 2 A	6	3½x4½	29.4	Pw	Zen	Vac	DR	Own	U	3	Own	Sp	17.9	4	D	138	3562	30x5	30x5
†White 61	1½	2450	Own 2 A	6	3½x4½	29.4	Pw	Zen	Vac	DR	Own	U	4	Own	Sp	23.4	4	D	148	4612	30x5	30x5D
†White 59 A	7½	6000	Own 3 A	6	4 x5¼	38.4	Pw	Zen	P	L-N	Own	U	4	Own	Sp	66.5	D	R	155⅛	—	40xP	40x14S
Willys-Knight T-103	1½	825	Own KGT	6	2⅞x4⅝	20.7	Pb	Til	Vac	Aut	Cov	U	4	Cla	Sp	42.33	4	B	131	2808	5.00x20	30x5
Willys Six 98 B	½	525	Own 98 B	6	3⅛x3⅞	25.35	Pb	Til	Vac	Aut	Own	U	3	Own	Sp	14.28	4	B	110	1903	5.00x19	5.00x19
Willys Six C-101	1½	695	Own 98 B	6	3¼x3⅞	25.35	Pb	Til	Vac	Aut	Cov	U	4	Cla	Sp	36.12	4	B	131	2675	5.50x20	5.50x20

GENERAL NOTATIONS

*†REFERENCE MARKS apply to individual lines only and explanations are given under the subdivision for each company in the "SPECIAL NOTATIONS."

CAPACITIES given in this table are in tons or fractions of tons. *Shows maximum allowable gross weight in pounds.

WHEEL BASES given are standard, but optional wheel bases are available in many cases.

ENGINE—Bud, Buda; Con, Continental; Her, Hercules; Kgt, Knight; Lyc, Lycoming; Wak Waukesha; Wis, Wisconsin. Hall, American Car & Foundry.

LUBRICATION—Pb, pressure lubrication to main and connecting rod bearings; Pw, full pressure lubrication to all bearings, including wrist-pins; CS, circulating splash; Sp, Splash.

CARBURETOR—Car, Carter; Mar, Marvel; Sch, Wheeler-Schebler; Str, Stromberg; DL, Detroit Lubricator; Til, Tillotson; Zen, Zenith-Detroit.

FUEL FEED—Gra, Gravity; Vac, Vacuum tank; P, Fuel pump.

IGNITION — AB, American-Bosch; Aut, Electric Auto-Lite; Eis, Eisemann; L-N, Loece-Neville; N-E, North East; RB, Robert Bosch; D R, Delco-Remy; Mag, Magneto.

TRANSMISSION—Br, L, Brown-Lipe; Cov, Covert; Ful, Fuller; Mec, Mechanics Machine; Mun, Muncie; W-G, Warner Gear; Cotta, Cotta Gear Co.

LOCATION—C, Center, amid; U, in unit with engine.

REAR AXLE—Cla, Clark Equipment; Col, Columbia; Eat, Eaton; Sal, Salisbury; Tim, Timken, Wis, Wisconsin.

FINAL DRIVE—IG, Internal gear; St, Straight bevel; Sp, Spiral bevel; Wo, Worm; 2R, Double reduction; Ch, Chain; Relay, Relay drive.

BRAKES—J, Jack shaft; R, Rear wheels; D, Drive shaft; 4, four-wheel; Tr, Transmission; V, Vacuum booster; W, Westinghouse air brake. B, Both front and rear wheels.

TIRES—B, Balloon; D, Dual; S, Solid.

SPECIAL NOTATIONS

AMERICAN-LA FRANCE

*Chief model also available as 2½-ton model, 34x7 tire, dual rear, weight 6,400. Price $3,900.

Chieftain model also available as Dump Truck, 160-inch wheel base.

Balloon tires optional on Chief, Chieftain and Big Chief models.

AUTOCAR

*Engines in these models are located under the driver's seat.

DAY-ELDER

Models GF and HF also available in 186-inch wheel base.

Model JF also available in the following wheel bases: 165, 180 and 204 inches.

Model KF also available in 202-inch wheel base and tractor 149.

DURANT LINE

*Price includes panel body.

GENERAL MOTORS TRUCK LINE

*Capacity indicated for each chassis is the recommended gross weight without exceeding rated capacity of tires. The tire size does not affect the straight rating for which chassis is guaranteed and each model is designed to operate satisfactorily under average conditions with loads giving a total gross weight (chassis, body, equipment and payload) equal to straight rating given below. The additional standard wheel base lengths, the number of additional tire types (tire combinations—each type carrying a recommended gross weight) and the ton range on a nominal payload basis for each model is given below.

Model	Straight Rating	Additional Wh. Bases, ins.	Tire Types	Payl'd Range
T-14	3800	None	None	—
T-15	5400	141	2	¾
T-17	6500	141	6	¾-1¼
T-19	8500	141, 152	16	1-2
T-25	8500	141, 152	11	1-1½
T-30	11000	152, 164	12	1½-2½
T-42	14000	152, 164, 181	10	2-3½
T-44	15000	152, 164, 181	10	2-4
T-60	18500	166¾, 184½, 200¼	16	2½-4½
T-82	22000	167½, 185¼, 201	10	3-6
T-90	28000	201, 220	5	5-7½

Optional rear axle ratios are available for all models.

F. W. D.

*Indicates six-wheel model. Special power take-off transmission, which provides 3 power take offs which may be operated in any transmission speed, optional on all models.

GRAMM

*Models B, C, D and E are furnished in three wheel base lengths—others on request.

*Models GY and GYB also available in 190-inch wheel base.

*Models HY and HYB also available in 210-inch wheel base.

Tire sizes and electrical equipment optional, depending upon type of service —coach or van.

*Model O Series, Large engine, pneumatic tires, special wheel bases optional at extra cost.

*Model T Series, Large engine, pneumatic tires, special wheel bases and 8 speed transmission optional at extra cost.

MACK LINE

Other wheel bases furnished on all truck models.

On 6-wheel jobs 4 rear wheels driven by chains, foot brake on 4 rear wheels.

HYP.—Hypoid drive, single reduction.

††Made also in tractor models.

REO LINE

RD2, at $5,450 on 180-inch wheel base.

*Tonner in wheel base, 123, 138; 1½-ton in wheel base, 137, 156, 152; 2-ton in wheel base, 152, 168; 3-ton in wheel base, 168, 179, 184.

RUGBY

F—Chassis weight includes body.

STEWART LINE

Model 30 and 30X can also be supplied in 120 and 140-inch wheel base.

*Models 16A and 16XA can be supplied in 145-inch and 160-inch wheel base.

Model 28X can be supplied in 145, 160 and 176-inch wheel base.

Model 29X can be supplied in 160 and 176-inch wheel base.

*Model 26XW can be supplied in 148, 176 and 190-inch wheel base.

*Models 18X, 32X and 33X can be supplied in 148, 190 and 220-inch wheel base.

*Models 19X, 31X and 27X can be supplied in 148, 172, 190, 220 and 235-inch wheel base.

STUDEBAKER LINE

*Capacity Model GN-N is 4,000 lbs. for body, cab, driver and payload.

Maximum gross load, chassis, body and payload for Models 77 and 88 is 12,500 lbs. and for Model 99 is 14,000 lbs.

‡Hand brake same as foot brake, standard. Hand brake on drive shaft, special equipment.

New Dealer Appointments By States and Makes

ARIZONA

Graham-Paige—Hamilton Motors, Tucson.

CALIFORNIA

Auburn — Ostrom Motor Sales Company, San Bernardino; Warner Auto Sales, Mount Shasta.

CANADA

Reo — Bindloss Garage, Bindloss, Alberta; Duchess Garage, Duchess, Alberta; Patricia Motors, Raymond, Alberta; Sugar City Motors, Raymond, Alberta; T. N. B. Garage, Schuler, Alberta.

COLORADO

Auburn — Kurland Motor Company; Ray E. Ortner, Pueblo.

CONNECTICUT

Auburn—Connor Auburn and Cord Company, Meriden.

FLORIDA

Reo—Hovey Brothers, Dunedin.

ILLINOIS

Reo—Almer J. Daus Motor Company, Elgin.

Auburn—Waukegan Road Garage, Glenview; Twin City Motor Mart, Urbana.

INDIANA

Graham-Paige—G. W. Cummins Sales Company, Richmond.

Reo — Leedy Motor Company, North Manchester.

IOWA

Graham-Paige—E. M. Amundson, Eagle Grove; C. W. Grahan, Oelwein.

Reo—West Ames Garage, Ames.

MAINE

Durant—Snowden's Garage, Deer Isle; Fred Theriault, Van Buren.

Auburn—J. J. Blasi, Augusta.

MASSACHUSETTS

Durant—Washington Street Garage, Haverhill.

MICHIGAN

Auburn — Havel Motor Sales, Utica; William Waas, Laurium.

MINNESOTA

Durant—G. H. Allyn, Madison Lake.

MISSOURI

Graham-Paige—Truitt Brothers Motor Company, Kirksville; Carl E. Nehre, Kirksville.

NEBRASKA

Auburn—Irvin L. Mosier, Benkelman.

NEW HAMPSHIRE

Reo—W. R. Sargent, Keene.

Chevrolet, Ford Sales Maintain Satisfactory Level

REPORTS FROM 4 CENTERS BRIGHT

Chicago Business Exceeds Expectations Of Dealers

CHICAGO, June 12.—The Ford and Chevrolet sales picture in this city was exceedingly bright last week. This is forcefully brought out by a bird's-eye view of business done by dealers in these two makes of cars, and it applies equally well to both new and used automobiles.

Ford and Chevrolet dealers throughout this territory report alike that orders taken have even surpassed their expectations. And, if further evidence were needed, it is only necessary to note the increase in the number of new Fords and Chevrolets dotting the streets of Chicago.

In behalf of Ford, it is announced that the past two weeks have resulted in rolling up the best sales record of the year thus far. As for stocks of used cars on hand, the net of the situation, dealers here state, is that "we are in fine shape."

From Chevrolet dealers the tidings are the same, with the further information divulged that sales of new cars were 20 per cent. greater and sales of used cars 25 per cent. better than had been anticipated. Inventories of used cars are not excessive, and in some instances they are even described as small.

It is obvious that Ford and Chevrolet dealers are going after business with aggressiveness and that they are bent upon taking advantage of the unusual present market for low-priced cars. Dealer organizations have been strengthened from the standpoint of personnel, attracting capable, high-type salesmen from within and without the automobile business.

Within recent weeks the Ford organization has been further fortified by the addition of several new dealers, while at least one of the older dealers has expanded notably by starting construction of a new modern sales and service building, which will give greatly increased facilities for handling all phases of his business.

Merchants in both of these makes of cars state that they are in excellent shape from every angle. In other words, they are not getting orders in volume, but are operating their establishments upon a profitable basis, ruling strictly against overallowances on cars taken in trade, selling accessories for new cars as well as old and making a drive for service business among owners who may not now be in the market for new cars.

The dealers of Fords and Chevrolets greeted the advent of June with considerable satisfaction, for it brought a run of real, summery weather, and they noted that the warm days aided in stimulating the desire to own cars among their prospects. Regardless of the weather, however, they are unquestionably operating "in high," and in no instances are they looking for any seasonable let-down either this month or next.

In view of the fact that buying power in general this year seems to have been crippled materially, at least as compared with the abnormal 1929, the way business is holding up, and in some instances showing an increase over last year, is frankly referred to by some Ford and Chevrolet dealers here as reason for both surprise and satisfaction. They have found that buyers are decidedly in the market on a large scale, and have also noted that prospects can be convinced, if properly sold, that they cannot reasonably be allowed excessive amounts on their old cars.

Chevrolet dealers are still experiencing the cumulative effect of an elaborate used car advertising campaign staged in Chicago recently, wherein they featured used Chevrolet models and took advantage of the opportunity to tell the motoring public of their used car values, policies and principles in general.

Philadelphia Has Gratifying Volume

PHILADELPHIA, June 12.—The sales volume of new Ford cars and trucks in the Philadelphia area for the final period in May, just ended, is reported virtually as good as that for the first period of the month, which was extremely gratifying. Sales during the second period in May underwent a slight temporary recession.

According to "key" dealers in the district, the used car situation in general is well in hand, some dealers having only a small residue of these stocks to show and most of them being fairly well cleaned out.

It is expected that June will be an especially active month for the sale of both new cars and trucks.

Coincident with the launching of National Ford Truck Week, a permanent truck show was inaugurated in the Ford Motor Company Building, at Broad Street and Lehigh Avenue, now again in use after a period of quiescence. The plant at this address is now a branch of the big Ford assembling establishment at Chester, Pa. From the Chester quarters to Broad Street and Lehigh Avenue have just been transferred the entire commercial car department and the departments of servicing and parts, leaving the Chester plant devoted to the assembling of Ford automobile units. J. T. Mullin is in charge of the commercial department and all assembling of trucks in this district will be done at the Philadelphia branch.

Retail deliveries of Ford cars and trucks by the Chester branch up to May 20 were 19.9 per cent. above those for the corresponding period of 1929.

The permanent truck exhibit has fifty Model AA Ford trucks on the second floor, the chassis equipped with a full line of Ford bodies and with bodies manufactured by various leading makers of equipment, including the York-Hoover Body Corporation, Martin-Parry Corporation, Hercules Corporation and others.

Salesmen representing these body manufacturers will be present to sell their respective products and Ford chassis sales are expected to keep step.

The displays will be changed frequently for the exhibit, and the branch is looking forward optimistically for stimulated trade in commercial cars.

Similar shows or permanent truck displays are opening simultaneously in Boston and New York, in which centers Ford buildings, out of use for some time, will be again placed in active operation.

Chevrolet Dealer Stages Contest on Opening New Outdoor Car Showroom

Visit Our

Outdoor Showroom

The tremendous popularity of the New Chevrolet "Six," resulting in an exceptionally large volume of business this Spring, places us in a position to offer a remarkable variety of high class Used Cars, at attractive low prices. We are placing many of these fine Used Cars on a large, well-lighted lot at the corner of

Raritan and 5th Aves., Highland Park, N. J.

Where we have provided ample room to exhibit them without crowding, so that they can be freely and readily inspected

These Cars Are Reconditioned and Guaranteed

AND SOLD WITH THE FAMOUS "O. K." THAT COUNTS

Our present stock includes such cars as Chevrolet, Ford, Nash, Buick, Plymouth, Durant, Chrysler etc. Also trucks and light deliveries

Win ½ the Cost of Your Used Car

You may win one-half the cost of your Used Car, which we rebate to you in cash. Every person purchasing a Used Car from us on or before July 4th (either at our Lot or at our Show Room) will receive a coupon entitling the holder to share in a drawing to be held July 5th, 1930, at 7:30 P. M. at 316 Burnet street. The owner of the winning coupon will receive in CASH a sum equal to one-half the cash selling price of such used car as he may have purchased from us, during this period. For example. If the winner has purchased a $200.00 Used Car from us, he will receive $100.00 in cash.

License Plates Free!

EVERY PURCHASER OF A USED CAR FROM MAY 29TH TO JULY 4TH INCLUSIVE WILL BE GIVEN LICENSE PLATES FREE!

Russell Chevrolet, Inc.

316-18-20 Burnet St., New Brunswick, N. J.

Telephone 4230

The Russell Chevrolet, Inc., New Brunswick, N. J., reports increased sales of used cars with the opening of its new outdoor showroom at Highland Park. In addition, Russell's offer of free license plates during the sale and a contest that gives winners one-half their purchase price back, drew considerable attention. The reproduction of the concern's advertisement during the contest shows how the sale was pushed.

Ford and Chevrolet Surpassing Records

DES MOINES, Ia., June 12.—Light car sales in this vicinity this spring have far excelled the high mark set for the same period last year, and are improving steadily, a survey of Chevrolet and Ford distributors reveals.

Dealers of this city are generally agreeable that new car sales for this spring are 20 per cent. higher than they were for the spring of 1929. Likewise, most of them agree that used car sales are at least 30 per cent. higher this spring than they were last spring.

According to G. R. Snodgrass of the Ed O'Dea Chevrolet Company, the present week has been the best that his company has had in both new and used cars for two years. Snodgrass is of the opinion that conditions will continue to improve at least until midsummer, and doubts if they will decline much then until actual cold weather sets in.

At the Jensen Motor Company, Sid Gordon reports that sales are abnormal, and have been since early spring. Jensen says that the new Ford Model A is still receiving much attention. Despite outstanding new car sales, the used car department is almost always short of cars for ready sale.

Other Ford and Chevrolet dealers here report the same conditions.

Boston Chevrolet Sales Fair to Good

BOSTON, MASS., June 12.—The past week in business of the Commonwealth Chevrolet Company is reported as good as any week in May, but considerably less than during the same week last year, though there was no pronounced drop in business over May weeks. Business for the week ended May 31 was better than the past week, owing to the holiday, which brought out many buyers that day, as well as earlier, in order to use a car on the holiday.

Stocks of new and used cars are about right for the time of year. No forcing of sales has been attempted. Used cars still show resistance, partly, perhaps, owing to the three extremely hot days of the week, when it was actually too hot to travel about Automobile Row looking at cars.

Retail sales are running about even with factory output. Business is fair to good throughout the metropolitan territory. New car sales for the week are about 20 per cent. off and used cars fully 50 per cent.

CHEVROLET NAMES TEVIS REGIONAL SALES MANAGER

Atlanta, Ga., June 12.—Promotion of P. G. Tevis, formerly sales promotion manager of the Columbia, S. C., zone offices of Chevrolet Motor Company, to the position of regional sales promotion manager, has just been announced by L. S. Costley, Southeastern regional manager of Chevrolet.

Mr. Tevis succeeds C. D. Asbury, who will become zone manager at Birmingham.

FORD OMAHA TRUCK SALES AHEAD OF LAST YEAR

Omaha, Neb., June 12.—W. E. Russell, manager of the Ford assembly plant here, and his Omaha and Nebraska dealers, participated in national Ford truck week with special demonstrations of the new four-speed model AA trucks. The assembly plant is now running on the largest production schedule in its history, and Ford truck sales as reported by dealers over the state are running somewhat ahead of the same period a year ago, according to Mr. Russell.

DEALER DOINGS

Aurora, Ill., June 12.—Bert and Leo Sennett have taken over the Cord and Auburn automobile dealer franchise here and will establish sales and garage at 52 South Lake St., the former Williams Garage. The new company is known as Sennett Motors, Inc. Bert Sennett, vice-president of the A. C. Berthold Company, Cadillac and La La Salle distributor ten years, and with that company fourteen years, is president and treasurer of the firm, and his brother, Leo, recently with the O. D. Larson Motor Company, Packard distributor, will be vice-president and secretary.

Fort Dodge, Ia., June 12.—The Reo Sales and Service Company, 820 1st Ave. South, will move to the R. D. Mitchell garage, 318 1st Ave. South. Thomas M. Harrington, manager of the company, announced. The stock of the Reo company, which has been in Mr. Harrington's charge since the company went bankrupt, has been disposed of to the S. & M. Finance Company, 23 North 11th St.

Personal Briefs

Newark, N. J., June 12.—Charles R. Lynch of the Reo Motor Car Company, Central Avenue, this city, has carried off a number of prizes in the contest that was participated in by the entire Reo sales organization in this country and Canada. He received one of the two special prizes for selling and delivering the largest number of Reo Model 20 sedans during the time of the contest. He also received a prize for selling the highest number of cars involving no trade-ins and a third prize for delivering nine new passenger cars during the contest.

Spokane, Wash., June 12.—J. F. Lenz, used car manager of L. J. Burrows, Inc., Oakland-Pontiac dealer, has been promoted to general sales manager in charge of new and used car operations. He succeeds Wesley Carr, who resigned to go to Portland, where he formerly was in the automobile business.

Buffalo, N. Y., June 12.—E. A. Olson, formerly associated with the Griffith Motor Corporation, Toledo, O., Chrysler distributor, has been appointed retail sales manager of the Justice Motor Corporation, western New York Chrysler distributor.

Newark, N. J., June 12.—R. J. Farnsworth, a salesman of the Morgan Motor Car Company, Oldsmobile dealer, has received from General Motors an electric coffee percolator, with creamer, sugar bowl and tray, for excelling in the sale of used cars from March 15 to April 15.

FORD DEALER'S MAY USED AND NEW CAR SALES TOTAL 225

JERSEY CITY, N. J., June 12.—George Chamberlin, president of the Belle-Meade Sales Corporation, Ford dealer of 2397 Boulevard, says that his firm will see the largest sales this summer of all seasons in the past years.

This month the firm expects to sell 175 Fords. This figure is considered a legitimate increase over the total of 136 new cars delivered during the month of May by the firm, which also managed to dispose of enough used cars to make a grand sales turnover of 225 automobiles.

Mr. Chamberlin says: "Our last month's record exceeded that of 1929 by 15 per cent., and, in the coming months, with the lowered prices and the exodus to the country by vacationers, we anticipate a greater increase.

"Depression is becoming more a myth than ever these days," he continued. "Vacations are all spent as far away as one can get. When we see a young person enter our showroom these days we immediately begin extolling the virtues of a roadster as an aid to vagabonding or extracting the best from the few weeks of camping or resorting. The same applies to older people, although the two-door sedan seems to be the only car they notice."

Mr. Chamberlin, describing the junking yards owned by the automobile manufacturing plants, says the new car market is the dealer's best bet.

The Belle-Meade showrooms have recently been decorated. Their central position, at the corner of Communipaw Avenue and Hudson Boulevard, makes them one of the outstanding bidders for trade in the Boulevard automobile row.

There is at present a sales staff of seven aiding Mr. Chamberlin. The service station, which is immediately in the rear, has a personnel of fifteen mechanics. This is the fourteenth year of the existence of the firm.

FORD SOMERVILLE PLANT PRODUCTION IN MAY UP

Somerville, Mass., June 12.—Deliveries of passenger and commercial cars by the branch of the Ford Motor Company in this city, up to May 20 of this year, were 19.8 per cent. above the corresponding period, from January 1, a year ago.

Production at the branch here has been steadily mounting since last December, when the new body types were introduced, until the daily schedule for May was 500 cars and trucks.

BALDERSTON-CHEVROLET SELLS 50 CARS TO STATE

Trenton, N. J., June 12.—One of the largest automobile deals in its history has been made by Balderston-Chevrolet, Inc., of this city. It has sold fifty automobiles to the state, ten of which were delivered yesterday.

Before June 14 the remaining forty will have been turned over to the state, Frank Roatch, manager of the company, said today. The deal was made through competitive bidding and the Balderston firm submitted the lowest estimate, Roatch stated.

AMAN CO. PLANS TO ERECT ADDITION IN CANTON, O.

Canton, O., June 12.—The William G. Aman Company, Ford distributor, has been granted a permit to erect a one-story brick garage addition to the rear of its present building on 12th Street N. E. The structure will be fireproof and will be 100 by 130 feet. It will be ready for occupancy late in the summer. The Aman company plans to almost double its service facilities and has augmented its mechanical force.

WOOD CHEVROLET CO. OPENS NEW QUARTERS

Birmingham, Ala., June 12.—The Wood Chevrolet Company, local Chevrolet dealership, is now located in its new home at Avenue C and 19th Street. H. F. Wood is general manager.

MANAGER TRAVELS BY PLANE

Columbia, S. C., June 12.—P. A. Watson, zone sales manager for the Chevrolet Motor Company, uses an airplane regularly in covering his territory in this state.

New Six and New Eight Announced by Hupmobile

EIGHT PRICED $1,345 TO $1,475; NEW SIX $1,145 UP TO $1,275

(Continued from Page 3)

degree angle. The intake valve is made of one-piece nickel-chromium steel. The exhaust valve is of one-piece, heat-resisting steel. Both seat and stem are completely water jacketed. The valves are actuated by "mushroom" type lifters of two-piece construction. They are completely inclosed, protecting them from grit and dust, and are lubricated both by pressure and spray from the crank case. The cam shaft and generator are driven by a silent steel chain.

The fuel system includes a 15-gallon tank. This fuel is drawn to the carburetor by a vacuum tank on the dash, whence it flows to the carburetor by gravity. The fuel filter prevents dirt or water from reaching the carburetor. The air cleaner is mounted at the air intake of carburetor and filters the ingoing air so that only clean air enters the carburetor.

The carburetor is a plain tube type with an accelerating pump—a new and exclusive feature. It provides a positive and definite accelerating charge as a momentary spurt of fuel when needed for fast getaway.

Gabriel triple shock absorbers are used front and rear, operating on an imrpoved hydraulic principle which provides maximum riding comfort.

Other mechanical features of the car include a powerful and full adjustable cam and lever steering gear, Hupmobile - Midland steeldraulic brakes with fully inclosed parts and positive action; full crowned, heavy gauge fenders; parking lights mounted on the crown of the front fenders; smartly curved rear fenders; distinctively short running boards of pressed steel which serve as a bumper against side blows, and tilt beam head lamps.

HAS POSITIVE FUEL PUMP

One of the features of the new eight is the positive type of fuel pump used instead of the conventional vacuum tank. This gear driven pump provides a constant supply of fuel to the carburetor. Water in the fuel cannot accumulate in the housing to freeze and burst it.

The gasoline supply tank has a capacity of 15 gallons. A double plain tube type of carburetor is used, incorporating an exclusive accelerating pump which provides an extra spurt of fuel when sudden acceleration is demanded. The fuel filter, through which the gasoline must pass before reaching the carburetor, eliminates dirt and water. A fine mesh screen, surrounding the gasoline pipe at the carburetor, provides a second check against foreign matter in the fuel supply. The spark control is of the semi-automatic type.

Crankcase ventilation is also a feature of the new eight cylinder engine. A special mesh screen is built into the crankcase filler cap to eliminate foreign matter. The air enters through this vent, circulates through the crankcase, and the fumes and vapor within are then drawn out under the car through an exhauster pipe through suction created by air passing across the diagonal end of the exhauster pipe.

The clutch of the new eight, conforming to Hupmobile practice, is of the single plate, dry disk type. Two of its characteristics are smooth, velvety action and long life.

BUILT IN RADIATOR SHUTTERS

The radiator of the new Century Eight has built-in radiator shutters which are thermostatically controlled A centrifugal, vane type of water pump circulates the water about the cylinder walls, cylinder head, valve seats and stems and spark plug seats, quickly carrying away excessive heat.

A full bearing type of transmission is used. The gear shift lever is well forward to permit entrance to the driver's seat from the opposite side of the front compartment.

The front axle is of the reverse Elliott I-beam type with its many advantages for easy steering. The rear axle is of the semi-floating type, the housing being a one-piece pressed steel banjo type. Both the ring gears and the driven pinion and shaft are of 3½ per cent. nickel steel. The differential is of the two-pinion type and is mounted on two adjustable roller bearings. The molybdenum axle shaft may be removed without disassembling the axle housing—an economy feature in necessary repair work.

One of the outstanding features of the new eight is the use of a special type of noiseless rubber spring shackle. This type of shackle precludes the necessity of lubricating these chassis parts. In addition, they are noiseless in operation—a necessary feature of the modern car. Hupmobile has developed two special machines for making and assembling these new rubber mounted shackles to speed up production for this particular model.

BIG, HEAVY FRAME

Contributing to the riding ease of the new Century Eight is the exceptionally sturdy and well-braced frame. It is of the double-drop type, 165¼ inches in length. The2side rail channels are 6⅛ inches deep and 5-32 of an inch thick. Six sturdy cross members brace the frame and provide a maximum of rigidity. The frame, extra wide at the rear for good balance, tapers at the forward end for a shorter turning radius and easier steering. The headlights are controlled by a ratchet type foot control pedal. Over-size starting motor, full vision windows, mono-control type of full vision windshield, Gabriel triple hydraulic shock absorbers front and rear, and Hupmobile's own road shock eliminator are other features.

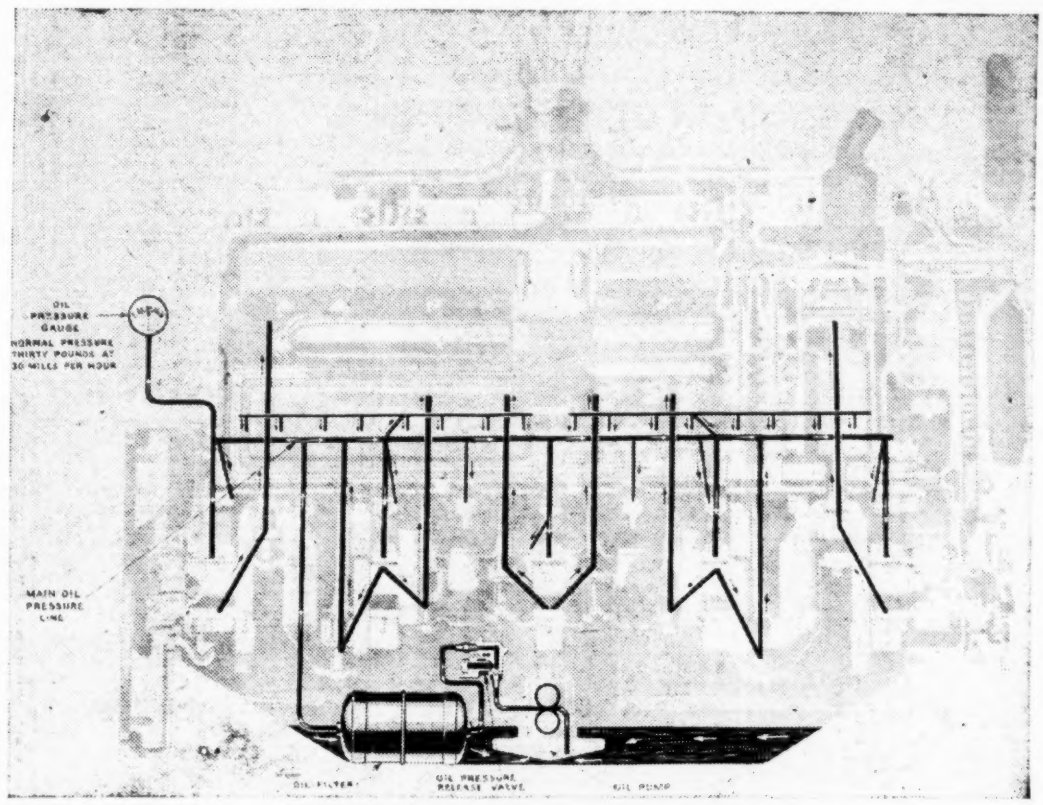
NEW SIX IS BIG CAR

The large size of the new six-cylinder model is really intensified by the length lines of the car and the absence of cross or perpendicular lines in the body work.

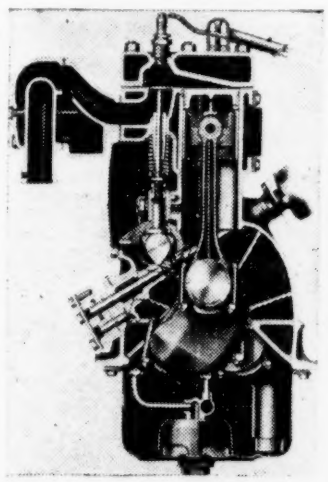
The radiator is high and narrow. Its trim appearance is suggestive of speed. The shell is narrower than previous models and the gracefully long hood contributes to the length lines of the car. Even the cowl line is extended in full harmony with the size of the car. The body molding and beading extend completely around the car and forward along the hood to the sides of the radiator. This feature carries the eye of the spectator along a horizontal angle and considerably adds to the length of the car.

Mechanically the new Century Six has outstanding power and speed development. The engine develops seventy horse power at 3,200 revolutions per minute and easily attains a speed of seventy miles an hour.

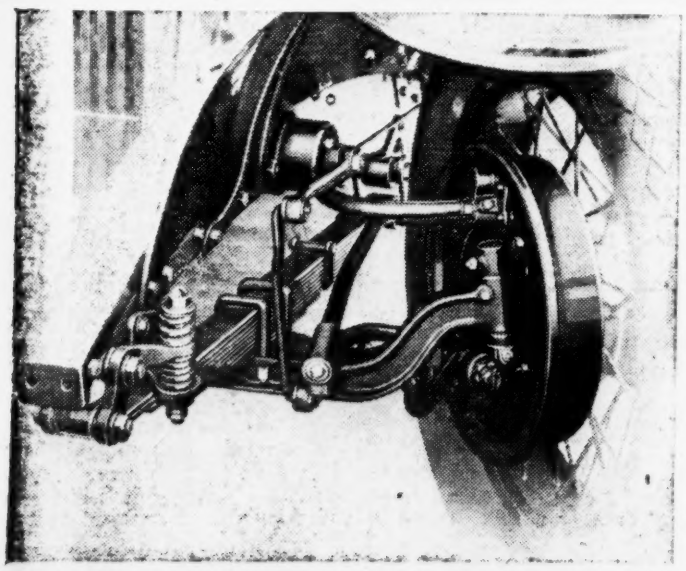
The Century Six engine has a bore and stroke of 3¼x4¼ inches. The piston displacement is 211.6. Compression ratio 5 to 1. The four point suspension has mountings cushioned on rubber front and rear so designed that there is no metal contact between engine and frame. This eliminates or diminishes noises arising from such contact to the point that they are inaudible to driver or passenger. Minor engine and chassis vibrations are also absorbed.


OIL PRESSURE GAUGE
NORMAL PRESSURE THIRTY POUNDS AT 30 MILES PER HOUR
MAIN OIL PRESSURE LINE
OIL FILTER
OIL PRESSURE RELEASE VALVE
OIL PUMP

FORTY-SIX VITAL bearing surfaces of the new Century Eight Hupmobile engine are under pressure lubrication. The above chart shows the direction of the oil flow



THIS CUTAWAY VIEW of the Century Six engine shows the pistons connecting, assembly, valve mechanism and cam shaft details in the new Century Six Hupmobile



BOTH THE NEW CENTURY SIX and Century Eight Hupmobiles are equipped with Gabriel threeway hydraulic shock absorbers, front and rear. This view shows the left front shock absorber, the road shock eliminator at the front end of the spring, and the brake and spring assembly on the Century Eight

HIGHER PRICED CAR SALES HOLD UP WELL

(Continued from Page 1)

the next best record among the higher-priced group, with registrations of 3,319, as against 3,393 in the 1929 period, a decline of only 74 units, equal to 2 per cent. Sales of the Lincoln were off 18 per cent., and registrations of the Black Hawk were down only 2.6 per cent. Stutz sales, however, were off 67 per cent. for the sharpest drop in the group.

Following are the registrations of the nine higher priced cars for the first four months of the current year, as compared with the corresponding period of last year, with the percentages of change shown:

	1930	1929	Pct. Chg.
Packard	8,848	14,148	— 37.0
La Salle	4,368	6,641	— 34.0
Franklin	3,319	3,393	— 2.0
Cadillac	3,196	5,242	— 39.0
Pierce-Arrow	2,611	2,095	+ 24.0
Lincoln	1,663	2,053	— 18.0
Cord	784	*	..
Stutz	224	685	— 67.0
Black Hawk	149	153	— 2.6
Totals	25,162	34,410	— 26.0

FAKE FOREIGN FORD STOCK WARNING IS ISSUED BY BUREAU

(Continued from Page 1)

on the partial payment plan. They offer stock for stipulated down payment and a fixed sum per month. Before the final payment becomes due and before the stock is delivered to the purchaser the company goes out of business and its officers disappear, only to begin operations at another location and under another name.

"Stocks of the Ford Motor Company of England, Ltd., and the Ford Motor Company of France are listed on the New York Curb market and the prices at which they are currently selling are printed in the financial pages of the newspapers. Nevertheless many persons are being led by unscrupulous brokers to pay far in excess of the market prices.

"The majority of stock brokers, of course, are honest. Our warning is directed solely against the fraudulent concerns that carry on their fleecing of the public under the guise of reputable concerns. Any one contemplating the purchase of stocks should first consult his local Better Business Bureau."

DU PONT CAR TO BE PRODUCED AT INDIAN PLANT IN SPRINGFIELD

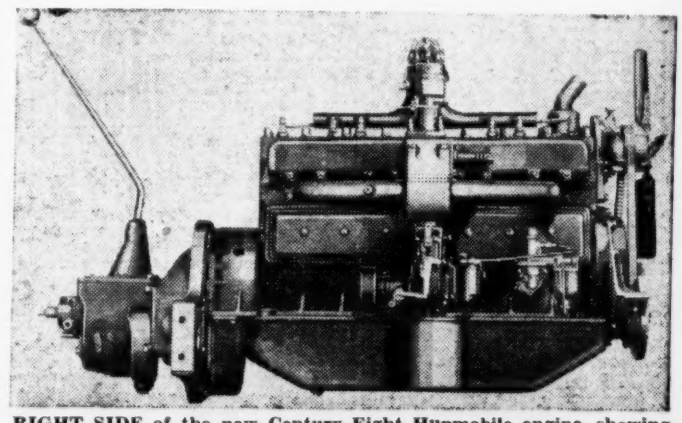
Springfield, Mass., June 12.—Alterations at the Indian plant, necessary for the production here of the Du Pont automobile, are under way. All the heavier work on the chassis will be done on the ground floor and most of the body work on the floor above. Loring Hosley is in charge of production for the Indian Motocycle Company and Du Pont Motors, Inc. The last named company is in process of moving its production from Wilmington, Del., and G. B. Weaver, chief engineer, has come here from Wilmington, and the engineering department will be fully established at the Indian within a month.

Motorcycles and out-board motors will continue production and late in the summer the company plans to put in production a new traffic car, to consist of a truck body built on the rear of a motorcycle chassis, with shelter for the driver. This will be built to carry a pay load of about 1,000 pounds. It is expected that this car will be an improvement over the old form of truck with side car, which Indian has produced for some time.

TAXI CHARGE DENIED BY GENERAL MOTORS

New York, June 12.—The General Motors Corporation denied yesterday before Supreme Court Justice Richard P. Lydon the charge that it had coerced railroads and steamship lines into awarding taxicab concessions to its subsidiary, the Terminal Cab Corporation, as alleged in the suit filed recently by the Yellow Taxi Corporation of New York.

Justice Lydon reserved decision on the Yellow Taxi Corporation's plea for a permanent injunction to bar the Terminal Cab Corporation from operating under a concession recently obtained from the Furness-Bermuda Line at Pier 95, North River. The temporary restraining order now in force will remain effective until Justice Lydon's decision is handed down.



RIGHT SIDE of the new Century Eight Hupmobile engine, showing the carburetor, fuel pump and intake manifold assemblies. The new engine develops ninety horse power at 3,200 revolutions per minute